# The Builder.

VOL. LXIII. No. 2589. SEPTEMBER 17, 1892.


## ILLUSTRATIONS.


Frieze: "Amores Caprarii."—Designed by Mr. John S. Babb ..... *Extra Large Size Ink-Photo.*
St. Bartholomew the Great, Smithfield: Exterior View of New North Transept.—Mr. Aston Webb, F.R.I.B.A, Architect ... *Double-Page Photo-Litho.*
St. Bartholomew the Great, Smithfield: New North Transept.—Mr. Aston Webb, F.R.I.B A., Architect ..... *Double-Page Photo-Litho.*
St. Bartholomew the Great, Smithfield; New South Transept.—Mr. Aston Webb, F.R.I.B.A., Architect ..... *Double-Page Photo-Litho.*
Ground Plan of St. Bartholomew the Great, Smithfield..... *Double-Page Block.*


*Blocks in Text.*


Mottiston Manor House, Isle of Wight..... Page 216 | South Front of Sheat Manor House, Isle of Wight ..... Page 217
Chimneypiece from Wolverton Manor House, Isle of Wight ..... Page 217


## CONTENTS.


Architecture of the Isle of Wight..... 215
Vestry Regulations with Regard to House Drainage..... 217
Notes..... 218
The Sanitary Appliances Exhibition at Portsmouth..... 220
Awards at the Sanitary Institute Congress ..... 222
The Sanitary Congress ..... 222
Design for Frieze; "Amores Caprarii" ..... 225
St. Bartholomew-the-Great, E.C. ..... 225
Competitions ..... 229
Books:—L. R. Milès' "Les Artistes Célèbres" (Paris: Librairie de l'Art); "Transactions of the Seventh International Congress of Hygiene and Demography" (London: Eyre & Spottiswoode); W. Robinson's "Garden Design and Architects' Gardens" (London: John Murray); E. Rowe's "Hints on Chip-carving" (London: Sutton, Drowley, & Co.); Gawthorp's "Manual of Practical Instruction in the Art of Braes Repoussé" (London: Sutton, Drowley, & Co.) ..... 229
Artistic Copyright ..... 231
The Institute and Architecture ..... 231
The Student's Column: Concrete.—XII..... 231
General Building News ..... 231
Sanitary and Engineering News..... 232
Stained Glass and Decoration..... 233
Foreign and Colonial ..... 233
Miscellaneous ..... 234
Capital and Labour..... 235
Meetings ..... 235
Recent Patents ..... 235
Some Recent Sales of Property ..... 235
Prices Current of Materials ..... 235

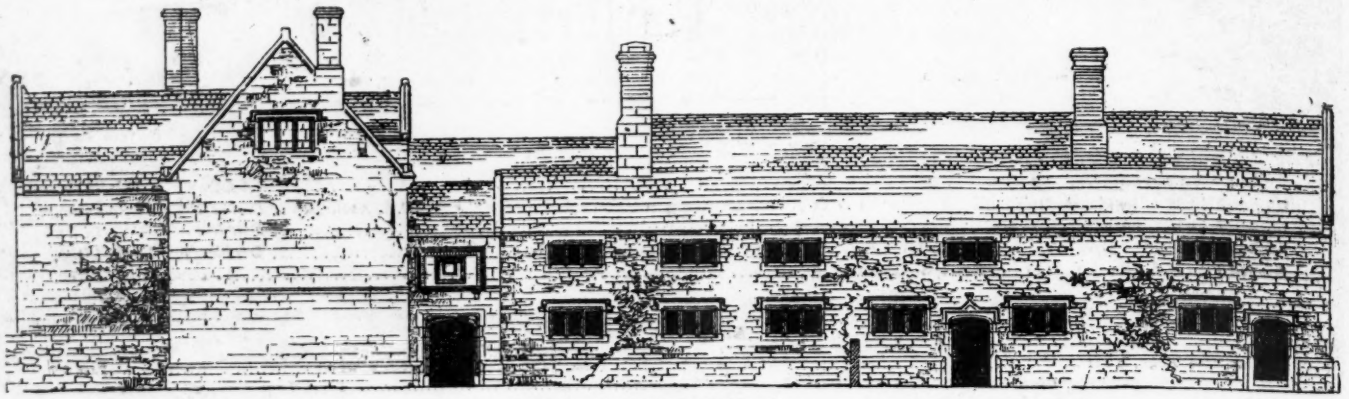

## *Architecture of the Isle of Wight.*

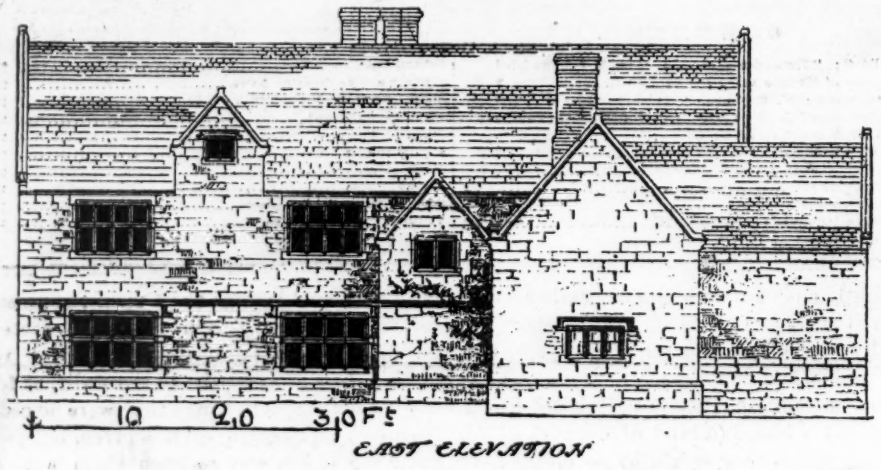
THE two concluding sections of Mr. Percy Stone's monograph of the architecture of the Isle of Wight are now issued,* and the whole book surprises one by the evidence it furnishes of the number of old buildings of more or less architectural interest which are included within the limits of this small island. The architectural remains of the island are not, it must be admitted, of very varied interest; there is a considerable sameness in the character of many of the small churches and manor houses, and the celebrated Castle is the only monument of first-class importance in the island. Yet the manor and farm houses, which perhaps are of more interest than the churches, have a peculiar charm in their quiet and unostentatious picturesqueness, and the project of making a complete illustrative collection of the ancient architecture of an island which occupies such a unique position, as a kind of outpost of southern England, and is so beloved by its inhabitants, was certainly worth undertaking, and has been very well carried out in the production of a book which will have a distinct value in any architectural library.

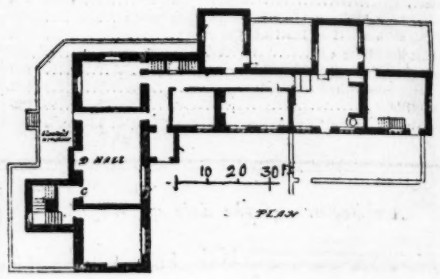
The East Medine or division of the island, as our readers may remember, was treated of in the first two parts of Mr. Stone's work, and the remaining two parts deal with the West Medine, the central object in which, both architecturally and historically, is Carisbrooke Castle, which naturally occupies a considerable portion of the fourth volume, in which it is grouped with domestic architecture, the third volume being occupied with the ecclesiastical architecture of the western half of the island. As in the case of many other famous castles, the site was probably a fortified one from a much earlier date than that of the Mediæval castle; the earthworks of an earlier period are still discernible, and doubtless Mr. Stone is right in his suggestion that the Romans had a camp in the island (a kind of outwork of the country which they would by no means have neglected), and that here was its position. The actual built Castle, however, dates its commencement, like the majority of our castles, from the incoming of the Normans, and it is from this period naturally that the author starts his description and notes, from various sources, on the history of the Castle, in the great hall of which it appears that William the Conqueror, in 1082, arrested his half-brother Odo on the eve of his embarkation for Normandy. We must refer the reader to the book for the succeeding steps in the history of the building, in tracing which the author has collected together into a short story the substance of a good many records which are derived from scattered and multifarious sources, and among which are included various characteristic incidents of Mediæval life and warfare. For the two centuries between Richard II. and Elizabeth, however, we are told that documentary evidence is wanting; but in the time of Elizabeth the castle occupies a prominent position again, having been strengthened as one of the bulwarks against Spanish invasion, and the Italian engineer Giannibelli was sent down from London to superintend the new fortifications. The accounts for all these works, says the author, are in the Public Record Office in detail. A considerable extract from these accounts is given in the Appendix, "John Leigh, Esquier" being named as "paymaster of the fortifications w$^{th}$in the sayde Ile of Weighte," and (with the characteristic lawlessness of spelling of the day) "Signior Gennybelly" or "Gennybellie" as the engineer in charge. Some of the items are interesting both as throwing light on what was done and on the charges for work at the period. John Pierson receives, "to make ye way to runne out of the north-east Curtin on the Flanke of the north Bullwoorke and to take awaie blacke earth in ye bottome of the Barbican of the South East Curtin," 5s.; and Richard More, "for takinge awaye ye coapinge stones of the plattforme and layinge them upon the greene before the Castell gate in length cxl. foote," 2s. 6d. Was this in preparation for replacing them after repairs to the walls, or for any use in the spot in which they were placed? No direct explanation of it is given, but probably the object was to keep them out of harm's way and replace them, as we find a note further on that "Michell Demeare and his companie" were to "cast down the piece of the wall upon the platforme before ye castell gate in length lx. foote," which accounts for the moving of part at least of the coping-stones. The larger sums named in the accounts show that a considerable amount of work was done; for the "North Easte Curtin" we find 149*l.* 13s. 2d. put down, and for the "Easte Bullwoorke and ij Casamatts" (casemates) 32*l.* 6s. 3d.; and "sondrie pyoners" for earthwork about the "South Easte Curtyn" received 120*l.* "Ffrederico Gennybelly" receives 4*l.* for his "riding charges from London to Newport," and his abode there till the commencement of the work, and afterwards 4*l.* "for riding charges from Newport to London, and going over to the New Forest to see after the timber."

In regard to the illustration of Carisbrooke, the author is able to reproduce a plan of the castle as it was in the fifteenth century; a plan made in 1741, and in the possession of the Engineer's Department, at Portsmouth; and a plan from a survey made in 1854 by W. T. Stratton. To these are added detailed plans to a larger scale of the Gatehouse, and of the residential portion of the castle, the latter shaded to show the dates of the various portions. There was little variation during the three centuries covered by the plans reproduced, in the general outline of the works, which show more than usually the irregular lining out of the walls following the run of the ground; this is not confined to the *enceinte* walls, but even the keep (in most cases a square, a circle, or a parallelogram, in the midst of the irregular enclosure of the *enceinte*) is here an irregular pile of no definable outline in plan, a kind of random enclosure following the form of the ground, and having a dozen sides of all lengths and at all angles. The architectural illustration of the Castle is very complete; we have an

* "Architectural Antiquities of the Isle of Wight from the Eleventh to the Seventeenth Centuries." Collected and drawn by Percy G. Stone, A.R.I.B.A. Published by him at 16, Great Marlborough-street, London. Parts iii. and iv.




*Mottiston Manor House, Isle of Wight.*

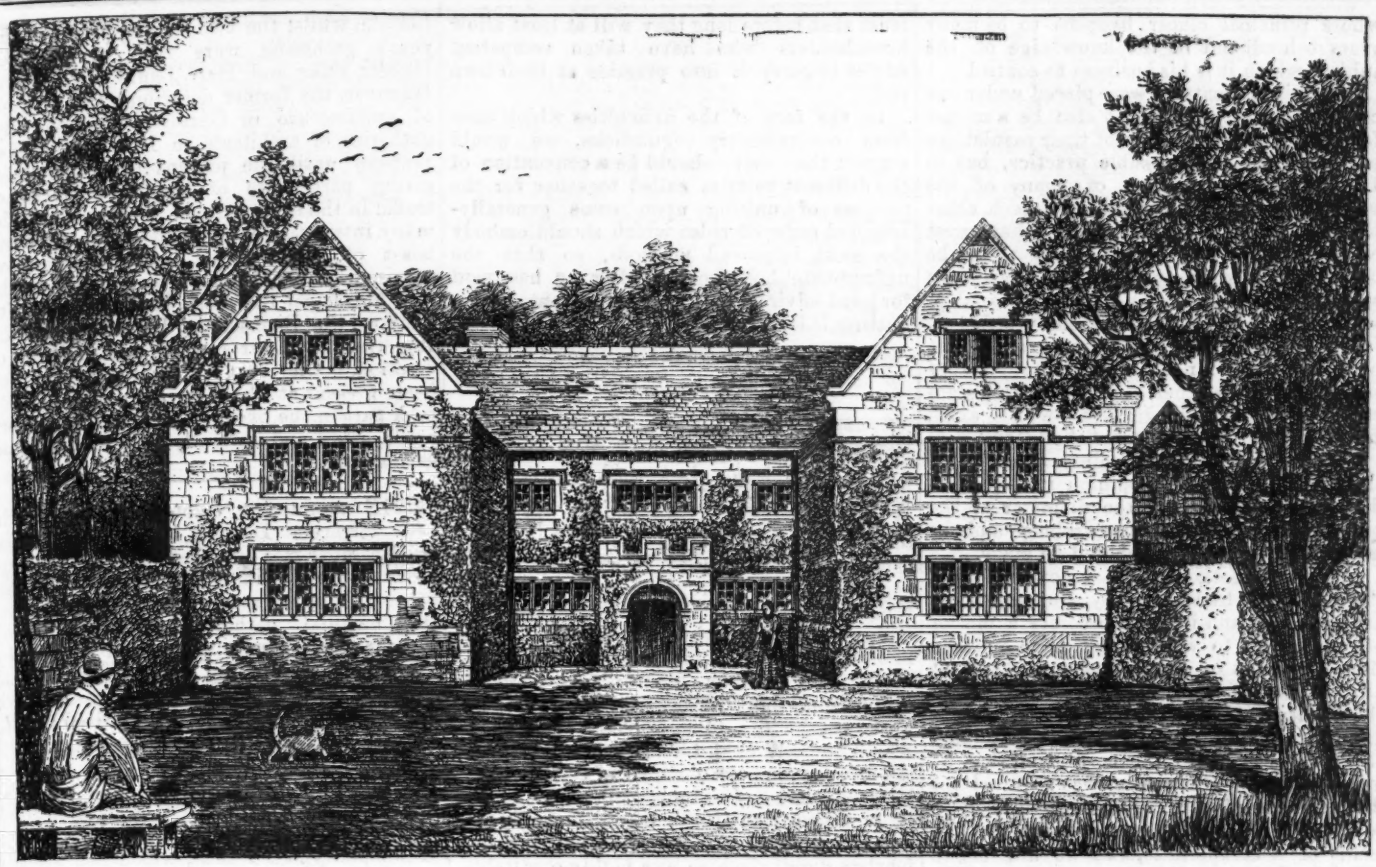
etching showing a view of the gate-towers, and geometrical elevation, plans and section of it, various other sketches, and measured details of such doors, arches, panellings, &c., as are left in a state for measuring.

Of the manor houses in the Western Medine, which occupy the remaining portion of Part IV. of the book (with the exception of a few notes on the history and the vestiges of what was once Cowes Castle), the most interesting in an architectural sense are Chale, Mottiston, and Sheat. The houses of this class in the western portion of the island seem on an average to be rather older than most of those in the east, they are Late Gothic without the intrusion of the Renaissance element which shows itself in the semi-classic porches frequent in the eastern portion of the island. The little house at Chale is peculiarly interesting, being an example of a small house of which parts date back to the fourteenth century, and having an original traceried two-light window in one of the gables. The house was erected by John de Langford, constable of Carisbrooke Castle, and Warden of the Island in the reign of Edward III. A sketch is given in the book of the ancient barn in connexion with the place, also a purely Gothic structure, and, but for its want of the usual windows, presenting almost an ecclesiastical type of structure. The plans of Chale and Mottiston are in the L shape, that of Sheat is in the more favourite E shape, two return wings and a porch between; in this case the porch seems either to be later than the rest or to have been modernised in regard to its entrance arch and imposts. Both these houses, however, are examples of the charming effect produced by entire simplicity in the treatment of mullioned windows and plain gables. In the case of Sheat, of the perspective view of which we give a reduced reproduction, the effect of the low long windows on each side of the porch, running right into the angles of the wings, is especially pretty. The elevations of Mottiston, of which we give reduced reproductions, are still simpler, but the whole makes a house which every artist will see with pleasure. We like it better than West Court, which the author seems to admire more, but which has less distinctly-marked character than either of the other three we have mentioned. Wolverton is another of the E-shaped houses, which is a very good example of its kind, and which contains some woodwork (later than the house) which is the best of the work of this kind which is illustrated in the book. We give a reproduction of the chimney-piece from one of the bedrooms, in which the contrast of the panels, and the bold treatment of the scroll panels, is very effective, and imparts a good deal of individuality to the work.

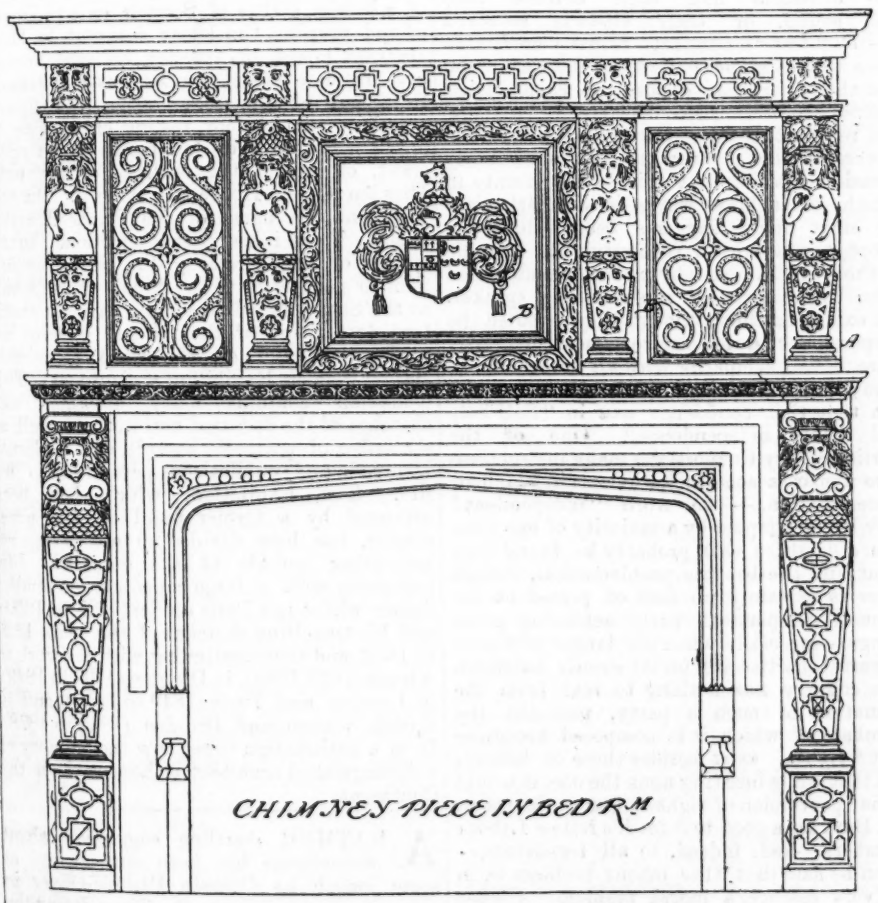
The towns of Newport and Yarmouth are each the subject of a short chapter. About Newport there might be much to say historically, but the author naturally confines himself mainly to what is within the professed object of his book, the architectural antiquities of the town, which are not however many or very striking, though two or three good little sketches can be made up from them.

Part III. of the book is occupied with the ecclesiastical work of the West Medine, the churches in which are however not noteworthy for any very marked architectural features; they are all small churches of a plain and unpretending character, with here and there some features of interest in regard to plan and arrangement. A good many of the churches were founded in Norman times, though there is little left now except rather Late Gothic. Freshwater Church did boast of a Norman arch, which was removed in the 1874 restoration and (if we understand the author rightly) rebuilt as the arch of the new north door. Mr. Stone remarks on the contrast between the exterior and interior of Freshwater Church, the first impression on seeing the church being that all the building is modern, whereas the framework of the structure, seen internally, is of twelfth century work. Our impression is that the author will find he has been deceived as to the date of the interior. We remember examining this church many years ago, and we believe publishing some notes on it (which however we cannot turn up now), but our recollection is that while the general aspect of the interior is no doubt such as to give a twelfth century impression, the details of the capitals will be found to be very anomalous, and such as to leave room for the conclusion that this is one of the examples (very rare but not unknown) of imitation at a later period of the detail of a preceding period. If there was any kind of situation where this was less unlikely than elsewhere it would be in an out-of-the-way island parish to which the general flow of Mediæval fashion in building might not have extended, and where churches were likely to be built on the pattern of existing work within reach. At all events we distinctly remember sending a section and sketch of one of the nave caps to the late Edmund Sharpe, who had made such a special study of Transitional Architecture, and receiving his decisive opinion in return to the effect that, according to all his experience, such a detail could not be *bonâ-fide* Transitional work. Carisbrooke Church is an interesting plan, with its deep internal buttresses in place of ordinary responds at the ends of the arcade; and the tower, with its bold staircase turret, is one of the best in the island, which, however, is not saying very much. Brighstone Church has a still larger (proportionally) and more prominent staircase turret, making a huge excrescence at one angle of the tower, and forming the only markedly characteristic feature of the church.

Among the curiosities illustrated is the brass to Daniel Evance in Calbourne Church, with figures of Time and Death flanking the inscription panel. The small church of Chale is a simple and very pleasing example of the churches of the island, and at the same place is the unusual and interesting octagonal light-house tower on the down, restored in the eighteenth century, but not so as to obscure its original features. It appears to have been placed at the extremity of a small oratory chapel, the foundations of which were laid bare in 1891, and which the author considers we may confidently affirm to have been the oratory founded by Walter de Godeton. The author observes that this curious building has not received the attention which it deserves. The history given



*Sheat Manor House, Isle of Wight: South Front.*




*From Wolverton Manor House, Isle of Wight.*

of it, which Mr. Stone claims to have unearthed, is a curious one for which we must refer our readers to the book; but the main point is that one Walter de Godeton, who had been concerned with others of the inhabitants in some illegal disposal of a wrecked cargo, had to expiate his crime, at the bidding of the Pope, by building a lighthouse to warn ships off the dangerous coast, coupled with an oratory for a priest who was to chant masses for the souls of those lost at sea, and to trim the light as required. The lighthouse portion of the building, the only part left standing, has a chamber at the top with an open window on each face, and ends in a low-pitched spire or conical roof of masonry. The structure was supported by buttresses of considerable projection at the lower part, which were partially destroyed, but enough was left to supply a restoration. A view of it as it existed before the restoration is given, from an old engraving. This is the most curious and unusual of all the architectural antiquities illustrated in the book. We may also direct attention to the interesting bench-end carvings of Newport Church, representing fourteen allegorical personages, "Temperance," "Fortitude," and other virtues, intermingled strangely with such abstractions as "Dialectica," "Rhetorica," "Musica," &c.; this latter class of subjects being each named below the carving, as more difficult of identification than the virtues with their accepted and recognisable symbols.

Two or three hands seem to have been employed over the illustrations; the author is responsible for the majority; a number of picturesque sketches are contributed by Mr. H. Burke Downing; we read the name of Mr. Bolton at the corner of some of the drawings, and a free and artist-like sketch of Mottiston Manor-house bears the signature of Mr. R. T. Blomfield. The only special deficiency we note in the book is the absence of any modern map of the island, which would have been a useful addition.

## VESTRY REGULATIONS WITH REGARD TO HOUSE DRAINAGE.

WHEN a London householder has obtained the best professional advice as to what he should do about his drains, it does not by any means follow that he will be allowed to carry it out. If, as an alternative to the employment of an expert, he informs himself as to those who are most distinguished as sanitary authorities among the officers of the London vestries, and then attempts to follow what they advise in their districts as the best he can do for himself in his own, it does not follow that the vestry under whose jurisdiction he happens to live will take the same view as his own, whether it be scientific or not, but, on the contrary, they may force him to adopt the more antiquated notions of their own surveyor, whether he likes it or not.

We know of cases in which architects have been obliged to change all their arrangements at the last moment and to alter their contracts, not in order to comply with more advanced requirements than they had provided for in their specifications, but to meet the requirements of some particular vestry,

whose principal officer happens to be many years behindhand in the knowledge of the subject which it is his business to control.

If drainage matters were placed under one central authority, it might still be a matter for argument whether or not their regulations embodied the best possible practice, but in London the regulations of many of the vestries are so inconsistent with each other that if some of them are right others must certainly be wrong. It follows that the householders in many large and important areas in London are being forced to adopt what is considered by different vestries as faulty or antiquated sanitation on the one hand, or new-fangled and unsatisfactory sanitation on the other. We think this state of things should no longer be allowed to exist, and the sooner it is remedied the better.

Two of the principal points upon which there is a difference of opinion in these conflicting regulations are the diameter of the pipes to be used for house drainage and the materials of which they should be made.

When old methods have become obsolete, the arguments by which they were supported are forgotten, and it often becomes a matter of wonder as to what could have induced their advocates to stand sponsor for them at all. When the plans of the present home of the Institute of Civil Engineers were under discussion, the united wisdom of the Council of that day came to the conclusion that no less a diameter than 9 in. was required for the drainage of that by no means extensive building. Perhaps this conclusion was the result of a compromise, and we are left to imagine what the suggestions must have been which emanated from those who believed in brick sewers of 2 ft. or 3 ft. in diameter as the proper arrangement to adopt. Now a diameter of 9 in. is universally condemned as being too great even for much larger buildings, and we are left to speculate upon what the arguments could have been which were urged in support of it, and this brings us to a consideration of what is being accepted now by those who are best entitled to give an opinion.

The grounds for forming a judgment are not very far to seek, and, starting with the proposition that the smaller the pipes are the better, so long as they provide for a maximum discharge, we shall find an answer among the most familiar formulæ. As a matter of fact, one well-known sanitary expert has used pipes of only 5 in. diameter for the largest London houses during the last ten years, and another has been recently advocating the use of cast-iron pipes only 4 in. in diameter for taking the discharge from houses having as many as twenty inhabitants, including roof and surface water; and there is no doubt that for all practical purposes the smaller diameter, with a good fall, is sufficient, even allowing for exceptionally heavy rainfalls, from areas up to 10,000 square feet. What more is wanted it is difficult to imagine, and yet, in the face of both experience and theory, there are London vestries who will allow no less diameter than 6 in., even for the smallest houses within their jurisdiction.

The other principal point of difference refers to the materials of which the drains for town houses should be made. During the last ten years heavy cast-iron pipes protected with Dr. Angus Smith's anti-corrosive solution have been coming into vogue for the drainage of town houses, and for one that was dealt with in that way, even five years ago, there must be fifty now. The preponderance of advantage in favour of this material is so great that even those who at one time were opposed to their use are now recommending their adoption, and at least one of the London vestries is desirous of making their use compulsory, as has already been done in the case of certain towns in the United States of America.

In spite of all this certain vestries do not even allow architects a choice in the matter, and prohibit the use of iron altogether.

The more-advanced practice of enlightened vestries only throws the action of incompetent surveyors into stronger relief, and we trust that before long they will at least allow householders who have taken competent advice to carry it into practice at their own risk.

In the face of the difficulties which arise from contradictory regulations, we would suggest that there should be a convention of the different vestries called together for the purpose of uniting upon some generally-accepted code of rules which should embody the most improved methods, so that the unfortunate householder, after he has paid for good advice, should not be prevented from putting it in practice.

## NOTES.

THE Trades Union Congress disposed of a great deal of business at Glasgow last week,—that is to say, they passed a great number of resolutions. The carrying out of many of these devolves upon the Parliamentary Committee, who were overwhelmed with suggestions and instructions, and whose position, judging from the proceedings at the Congress, is somewhat unenviable. "No man can serve two masters," and when the views of a Labour Member's constituents differ from those of his trades union or the Congress, he has to make his choice as to which he will hold to. A great feature of the debates was the defence of certain members who had had the misfortune to offend a large proportion of the delegates from this cause, and their position was upheld with a fearless dignity which was highly creditable, and was evidently appreciated by an assembly which would promptly have condemned the offenders had their defence been less sound, or their attitude betrayed the slightest vacillation. Equally creditable were the utterances of those delegates who had the temerity to oppose the Eight Hours Bill, which, a Durham delegate declared, he had received an emphatic mandate from the miners of that county to oppose on every occasion. Seeing that this is the county in which,—at a large works in Sunderland,—an eight hours day has been voluntarily adopted and proved successful, the attitude of the Durham men may be better understood from the remarks of a succeeding speaker. He explained that although they opposed the proposal for a legislative enactment, they were in full sympathy with all trades unions who sought to reduce the hours of labour; but that their confidence was in "Self-help and manly independence." One of the Parliamentary Committee's many instructions is to prepare a scheme for independent labour representation, — the word "independent" only being adopted by a majority of one vote. The difficulties will probably be found very great, and the benefits problematical, though there is certainly no lack of precedent for a small independent party achieving great things,—especially when the larger, and more powerful, parties are pretty evenly balanced. The country has nothing to fear from the formation of such a party, provided the members of which it is composed recognise that "rights" exist besides those of labour; and that while insisting upon the one, it would be but perversion of right to ignore the other. Mr. Burt set a good text for his fellow Labour Members,—and, indeed, to all legislators,—when he said that "the labour problem is, in its very essence, a moral problem. Higher character, nobler conduct are wanted all round. The faults are not wholly on one side, nor are the virtues."

THE Berlin press has given very full particulars of the biennial gathering of German architects and civil engineers which took place at Leipsic during the last days of August. As usual there was a combination of official meetings at which a few papers were read, then a good deal of sight-seeing and a still greater amount of banquetting and general amusement. The customary lecture on the history of the city visited by the societies was given by Professor Schreiber, of Leipsic, whilst the two leading papers of this year's gathering were read by Professor Hubert Stier and Herr Launhardt, both of Hanover, the former describing the progress of architecture in Germany since the first gathering of architects in 1842 (also held at Leipsic) until the present day, the latter giving particulars of the development of traffic in the same period. Nearly all of the many interesting public buildings Leipsic can boast of were visited. Special attention seems, however, to have been given to the new Municipal Buildings, the new University Library, the Booksellers' Exchange, and the Imperial Law Courts which are in course of erection. One or two architects who had been present at the first gathering in 1842 took part in the one now held on the fiftieth anniversary, and naturally were received with enthusiasm.

THE monument erected on the Brühl terrace at Dresden in memory of Gottfried Semper was unveiled with much ceremony at the beginning of this month, a large contingent of the architects who had attended the biennial gathering at Leipsic being present. It is due to the initiative given by the central committee of the amalgamated Societies of German Architects and Civil Engineers (whose members subscribed 1,000*l.*) that the monument is now to be seen; at the same time it should be mentioned that the King of Saxony gave the very appropriate site on which the memorial stands, in front of the New Academy buildings, and that the Municipality of Dresden, which had already founded a valuable scholarship in the name of the deceased artist, added the sum of 250*l.* to the fund. The monument consists of a bronze statue of Semper on a pediment of red granite, the latter designed by Herr Baurath Giese, of Dresden, and the former cast from a model by Professor Johannes Schilling, of the same city. The figure stands with one foot resting on a piece of entablature, and in his hands is an open sheet, on which the outlines of the new Dresden Opera House are defined. On the pediment the name of the deceased artist is cut. There is no other inscription. In the course of the ceremony Professor Lipsius, Semper's successor to the Architectural Chair at the Saxon Royal Academy, gave an excellent description of the life and work of his predecessor, and on the same occasion a special Semper Exhibition was opened. This collection contains many drawings and sketches of the deceased architect, as well as a number of portraits, awards, and diplomas received, and publications pertaining to his life. The Exhibition, which has been arranged by a former pupil of the great master, has been divided up into groups representing periods of the deceased's life, beginning with a large collection of studies drawn whilst in a Paris atelier (1827 to 1830), and his travelling sketches of the years 1830 to 1833, and then continuing with his work in Altona (1833-1834), in Dresden (1834 to 1849), in London and Paris (1849 to 1855), and in Zürich, Vienna, and Dresden (1855 to 1878). It is a satisfaction to see how the memory of a distinguished architect is honoured on the Continent.

A RATHER startling suggestion about Stonehenge has been entered into at some length by Captain Pasfield-Oliver in some communications to the *Times* during the last few days, to the effect that the large stones now *in situ* are only the main masonic framework of what was once an enclosed and roofed-in temple, the remains of the roof and of the filling of the walls having perished or been removed in the course of ages. Captain Pasfield-Oliver has evidently made a detailed study of remains of this kind in different parts of the world, but he seems to have been reasoning from the evidence of structures of much smaller size and not quite the same character. Two objections must at once occur to an architect. First, that some remains of the filling of the walls must, according to all probabilities, have remained

on or near the site in such a case; secondly (which is much more important) that the existence of such filling-in masonry between the large stones must have left some sign on the jambs of the latter, and that no existence of any marks of the kind is pretended to have been discovered. The further question arises, if the structure were roofed, what kind of roof can we imagine for it? The probabilities would be in favour of large stone slabs, but these would have been as difficult to carry away, or destroy all traces of, as the trilithons themselves. We cannot therefore regard the suggestion as one which is to be seriously entertained.

---

ON May 2, 1891, we published the general results of an interesting series of experiments made by Mr. Kirkaldy on the strength of concrete beams in which iron rods had been embedded in the manner patented by Mr. F. G. Edwards for the purpose of increasing the strength of those parts subjected to tensional stresses. The rods are embedded along the portions of the beams which are in tension, and are either turned up at their ends or corrugated to increase their hold of the concrete, since upon this hold the longitudinal tension they are able to take depends. Mr. Edwards, who has now completed his invention, points out that this connexion can also be made by screwing on a nut with a washer at each end of the rods, and this appears to us to be a more satisfactory manner of securing them. After the experiments above referred to there can be no doubt that the strength of concrete beams, as well as their ultimate deflection under loading, is very considerably increased by the introduction of the rods, but we do not think it is a form of construction likely to inspire very much confidence, and we doubt if the cost of the beams would compare favourably with that of mild steel rolled joist of equal strength. At the request of the patentee, we have given further careful consideration to the principle and to the detailed provisions of his patent, but on the whole we feel bound to say that our opinion remains very much as it was expressed in the article above referred to, written immediately after witnessing the tests at Mr. Kirkaldy's works.

---

A REPORT to the Local Government Board by Dr. Parsons* (dated June 24), in reference to an outbreak of typhoid fever at Newfield, in the district of the Ashby Woulds Local Board, differs from most reports of this kind in not tracing the disease directly to defects in drainage, which appears to be in a less unsatisfactory condition than it is usually found to be in such cases; but the causes at all events appear to have been preventable, and to have been closely connected with the arrangement of buildings and their surroundings. The Report says:—"Given a washhouse used in common by the whole row of houses, and in which the soiled linen of the first cases was washed; a back yard, also common to the whole row, with surface in part unpaved and ill-kept; a deficient water-supply; and people of the mining class, careless in matters relating to health, it is easy to think of numerous ways in which the infection of enteric fever might be transmitted." In regard to the water-supply, however, we have the old and constantly-recurring complaint in country districts of insufficient and distant water-supply, placing every difficulty in the way of procuring an adequate daily supply:—

"The water-supply of Newfield is very scanty and inconvenient of access. The water in use comes from the Moira water service (which is derived from a spring at Willesley), and is delivered into an iron tank, consisting of an old upright boiler, from which it is drawn by a tap. The tap is kept locked and is only accessible for a short time twice a day, at which times people have to gather around the tank with their buckets, waiting to take their turn when the tap is unlocked. The tank stands among the old pit heaps a considerable distance from the houses; the reason, it is said, being that the level to which the water will rise will not allow it to be placed any nearer. From New Row the tank is 300 yards distant, and the path from it is uphill. Since the fever, however, an additional supply for washing purposes has been brought by a cart and delivered into a tub by the washhouse; but drinking water is still fetched from the tank."

* Published by Eyre & Spottiswoode.

---

ANOTHER report by the same hand (dated June 27), in regard to the prevalence of enteric fever and diphtheria in the Ashby-de-la-Zouch Rural Sanitary District, brings to light once more two of the most common predisposing causes of disease, viz., middens not cleared regularly, and wells not sufficiently isolated from soakage. In regard to the first point we read:—

"The privies either are of the midden kind, sometimes with a horizontal partition in the Lancashire fashion, to separate the receptacle for ashes above from that for excreta below, or they have large underground vaults. Owing to the bottoms of the privy pits being below the ground-level, and sometimes to their being open to the rain, their contents are commonly wet and offensive. In some instances the middens have been connected with the drains with a view to carrying off the water from them, an expedient open to very grave objections. . . . . There is a great want of better arrangement for the removal of the contents of privies and ashpits. The Sanitary Authority do not undertake the work, and it is left to occupiers, who are dependent upon farmers for this service. The nightsoil is not much valued as manure, owing to the large admixture of ashes and useless material which it contains. A small sum has often to be paid for its removal, and there is great difficulty in getting it taken away at all at those seasons of the year when the farmers' men and carts are otherwise employed. At the time of my visit, which was one when it might be supposed that less difficulty in this respect would be met with, large accumulations of ashes and nightsoil were the rule rather than the exception, many middens were over-full, and great heaps of ashes were littered all around them. A further danger to health arises from the circumstance that, owing to the difficulty of getting rid of the nightsoil, the occupiers are often led to dispose of it on their garden plots, near the houses and wells. An examination of the soil in the gardens often showed it to be largely composed of ashes, and in more than one instance I saw heaps of nightsoil, which had been removed from the privies, standing in the gardens *within a few feet of the well.*"

In regard to the general subject of the position of the wells, we read further on,—

"The drinking water supplied in Coalville is derived exclusively from private wells, there being no public service. The wells are of moderate depth, and are usually fitted with pumps, one pump serving for a block of buildings. Some properties, however, are without water fit for drinking, and the tenants *have to fetch water whence they can*, unless, as is sometimes done, the landlord pays an acknowledgment for the use of the pump on a neighbouring property. . . . . The upper part of the wells is rarely made watertight, so as to be secured against the entrance of surface impurities, and of many the water is muddy after rain. The well has usually drains in its neighbourhood; a common position for the pump, as already mentioned, being opposite the entry, where the drains from the whole block of houses converge to pass through the entry into the street sewer; and if these drains be leaky, the well water is exposed to contamination from them. . . . . The wells in Coalville must therefore be looked upon as being at all times more or less exposed to serious risk of dangerous pollution, and of many of them the water is admittedly unfit to drink. It is evident that a public service of wholesome water from an outside source is greatly needed at Coalville, but consideration of this matter, like others, has awaited the settlement of the Local Board question."

Is it surprising that Dr. Parsons should have had to report on "the prevalence of enteric fever and diphtheria" in a neighbourhood thus circumstanced?

---

THE Decimal Association cannot fail to have been gratified and encouraged,—and, perhaps, agreeably surprised,—at the attitude of the Trades Union Congress towards their question. The following resolution was passed,—apparently without any dissent:—"That, in the opinion of this Congress, it is highly desirable, in the interests of the working classes and of the general trade of the country, that the decimal system of weights, measures, and coinage shall be adopted as a national system; and that the Parliamentary Committee be instructed to promote legislation on this question." The latter part of the resolution is characteristic of the Labour Parliament, where they "take the bull by the horns," and where questions are not approached first and then cautiously brought step by step to practical issues; and contrasts somewhat oddly with the resolutions of such bodies as Chambers of Commerce, who have declared their conviction of the great desirability of this reform long before the trades unions recognised it as being of any importance whatever. The resolution adopted by the Associated Chambers of Commerce on March 26, 1890, reads, "That, having regard to the strong opinion held by this Association as to the desirability of introducing into this country the decimal system of coinage, weights, and measures, this Association is of opinion that the most practical course to adopt in order to assure the ultimate attainment of what is generally agreed to be so desirable in the interests of commerce, is to commence the study of the decimal system in all public elementary schools." The delay in grappling with this question is undoubtedly to be ascribed to apprehension on the part of the legislature as to the magnitude of the obstacles which must be met with in passing from the one system to the other; for the Select Committee which investigated the subject unhesitatingly declared that "No unnecessary delay should prevent the full introduction of the decimal system." It is from the working classes that the principal opposition to the change has been anticipated; and here we have them boldly instructing their representatives to "promote legislation" upon a subject which successive administrations have been afraid to touch.

---

THE unfortunate omnibus accident in Piccadilly has proved that omnibuses as at present built may be turned over if the horses fall, improbable as such an event must appear. We have not seen any reliable statement as to how the vehicle was situated at the moment of the accident, but we should expect to find that it was more or less askew on the roadway, turning to avoid something else, and therefore somewhat across the incline of Piccadilly at that part. Had it been heading straight down the incline we can hardly see any reason for the upset. The accident however enforces the point, to which attention has been drawn before in our columns (and to which a correspondent, "F.R.C.S." calls attention in Wednesday's *Times*), that the incline of that part of Piccadilly, considering the crowded traffic there, is a distinct source of danger, aggravated by two circumstances, the often slippery state of the wood pavement, and the rate of driving down the incline frequently indulged in. "F.R.C.S." renews the suggestion that the incline should be lessened by raising the hollow part of Piccadilly, and there is no doubt this could easily be done as far as the roadway is concerned. It must be remembered however that as matters now stand it is almost impossible to raise the footway, owing to the levels of the ground-floor entrances of some (not all) of the houses; and the appearance of the footway in a hole, as it were, would be very unsightly in such a street, and very considerable compensation would have to be paid for what would certainly constitute an injury to the valuable house property there. We do not say that these objections ought not to be put aside in order to make the roadway safer for such a large traffic; we only point out that they exist and cannot be overlooked.

---

IN his usual four-weekly report on the sanitary condition of Kensington the Medical Officer of Health, Dr. Orme Dudfield, commenting on the recent scare about glanders, makes some practical and certainly not uncalled-for remarks in regard to the manner in which both the development of this disease in horses, and its occasional communication to human beings, is connected with the construction and arrangement of the

buildings occupied by horses and those employed about them. We quote Dr. Dudfield's words:—

"Glanders may, probably, be generated *de novo* by insanitary conditions, and, if it is so, will never be got rid of until more attention than customary is paid to the sanitation of stables. And why should not as much care be bestowed,—by operation of law if necessary,—upon the inspection of stables, as in the case of cowhouses? More airspace, light, ventilation, and better drainage arrangements are required in these places. It will hardly be questioned that it would 'pay,' in every way, to treat horses better than is commonly done, in respect of their home accommodation, especially having regard to the fact that insanitary conditions in stables, by reducing the resisting power of the animal, render him more liable to attack by disease, both of an ordinary kind, and specific, like glanders and farcy. But apart from this, it must be remembered that many thousands of persons in the metropolis necessarily live in contact with horses, in rooms over stables, and it cannot be doubted that disease and death are not seldom the result of malaria, due to the insanitary conditions of stables, as in the case to which I have already alluded, where two of our parishioners came to a horrible end from glanders, which there was every reason to believe was due, not to contact with the diseased animals, but to infection conveyed by a polluted atmosphere."

In regard to the horses, we have over and over again urged that ventilation to stables should receive more attention than it does, and that in the majority of cases it is so defective that human beings exposed to the same conditions in regard to ventilation would never be expected to keep in good health; and yet it is expected that horses (more delicate creatures, in some respects, than men) should be healthy under these conditions. The method of construction of rooms situated over stables (which in a London mews it seems impossible from considerations of space to avoid), is also a matter of the greatest importance. They should be completely isolated from all air-contact with the stables, and always separated from the latter by a floor of concrete or other impervious material.

---

IN no long time the Great Western Railway Company will have enlarged their line in the London section, and will have also increased the size of several of their stations. At Maidenhead and Taplow work is being vigorously prosecuted, and the facilities for what may also be called suburban traffic on this line will be much improved. It is very strange, however, that the building of a new station at Reading is not taken in hand. Public attention has been more than once directed to the danger to the traffic by reason of up and down trains having to be brought to the same line of platform. Apart from this, the elongated shed which is dignified by the name of a station is inconvenient and altogether unworthy of an important town such as Reading, and one which is the centre of a district. No time should be lost not only in erecting a new station, but in making arrangements for its use by the South-Western Company, so that passengers from one line to the other should not have to use two different stations. It is sometimes said that railway companies know their own business best, but every day shows that even the best managed companies constantly require pressure from the public in order to keep them up to the mark.

---

IT is to be hoped that the decision of Mr. Hopkins in the case of the complaint of Miss Armiger against the Southwark and Vauxhall Water Company will afford a useful lesson to water companies in regard to their frequently high-handed and most insanitary procedure in the cutting off of water-supply. It appears that Miss Armiger received her supply from a pipe which also supplied the adjoining premises, and that the adjoining owner had applied to have constant service put on at his house, and the water had been cut off while this was being done. Miss Armiger accordingly found her water-supply unexpectedly cut off, and complained to the company, who allowed a week to elapse before seeing into the matter. The magistrate said that the company's defence was one "with no sort of justification," and imposed a penalty of 10*l.* for the neglect, coupled with a compensation penalty of 1*l.* a day for the eight days during which the complainant was left without water after giving the company notice. That water companies should have the power to cut off a necessary of life and of the sanitary condition of a house even for the enforcement of payment is a condition which is open to the strongest objection in the general interests of the community; but that they should fail for a week to investigate a complaint of want of water from a customer against whom they appear to have had no claim for default of payment is scandalous, and it is to be hoped that next time any water company neglects its duty in this manner a much more substantial fine will be imposed.

---

IN the programme of the competition for designs for a new market-hall for Budapest (mentioned in our foreign intelligence of this week), there are two points that deserve the attention of promoters of competitions in England. The first is: "any special idea or feature shown in a design sent in but not premiated is not to be made use of by the promoters of the competition without the special permission of the author"; and the second is that "every competitor will receive a good reproduction of the drawings of the design which the jury considers most suitable." The competition seems to be very well arranged, the fact of having fifteen first-class assessors being exceptional, even on the Continent, where the number seldom exceeds seven.

---

A CHICAGO paper, *The Economist* (not to be confounded with the English journal of the same name), gives a rejoicing description of a new building to be erected in that city, in which the only visible material in front will be plate-glass divided out by aluminium mullions. This is supposed to be the latest and purest external expression of the characteristic method of steel-frame building popular in Chicago and other modern cities of the States, in which the real construction is a steel framing which is built up independently of the outer walls, the latter being only the architectural face. The aluminium facing to the framing is of course equally a mere skin treatment, but it has the effect of giving to what is really a metal construction the appearance of metal. That is what "business architecture" in the new country seems to be tending to. The Chicago paper thinks the structure "will make its mark in the world as new, original, and beautiful." We may admit the first two adjectives, but not the last. Such structures may be practical and economical, but the building has ceased to be architecture, in any sense in which that expression has hitherto been understood in the world.

---

## THE SANITARY APPLIANCES EXHIBITION AT PORTSMOUTH.

THE usual Exhibition in connexion with the Sanitary Congress is being held in the New Drill-hall, and will remain open after the close of the Congress, until October 8. An endeavour is being wisely made to attract the general public, who can hardly be induced to take much notice of the regular Congress work, to visit the Exhibition by the bait of promenade concerts, model dairy and practical demonstrations, as well as lectures on cookery. Thus, whilst being amused, some additional knowledge of hygiene and sanitation may be imbibed by the general public. The model dairy has been fitted up by the North Wilts Dairy Company, of Portsmouth, with cream separators, churns, butter-worker, and Devonshire cream-maker; and the cows being also on the premises, visitors will be able to see in action the whole process of dairy work as illustrated by Miss Hall. The building is lighted by electric light from a dynamo driven by an Otto gas-engine, and exhibited by Messrs. Crompton & Co., who also contribute a number of cooking utensils heated by electric current, the utility of which is practically demonstrated by Mrs. W. H. Knight in her lectures on hygienic cookery, and compared with the operations of gas-stove and oil-stove cookery. The electric cooking utensils are, as our readers will readily understand, made on the principle of constructing the metal surfaces of pots and pans with wires of high resistance imbedded and enamelled to the surface, and this application of electricity suggests many great possibilities in the future.

We are pleased to notice that the Exhibition was practically complete at the time of opening, a desideratum which is not always obtained in the case of exhibitions. This desirable result was no doubt partly due to the regulation that all exhibits were to be in position before the judging commenced, some three days before the opening. We may here mention that the judges for this year are:—Mr. Ernest Turner, F.R.I B.A., chairman; Mr. R. W. Peregrine Birch, M.Inst. C.E.; Professor A. Wynter Blyth, M R.C.S.; Professor W. H. Corfield, M.A., M.D. Oxon, F.R.C.P.; Mr. Thos. W. Cutler, F.R.I.B.A.; Mr. Rogers Field, B.A., M.Inst. C E.; Mr. Baldwin Latham, M.Inst. C.E.; Mr. Henry Law, M.Inst. C.E.; Dr. A. Newsholme, M.D., D.P.H.; and Dr. Louis Parkes, M.D., D.P.H.

The exhibits have been classified in four divisions, viz.:—

Division A, Science in relation to Hygiene. B, Hygiene of Special Classes, Trades, and Professions. C, Construction and Sanitary Apparatus, which is subdivided into the following three classes:—

1. Building Materials, Construction, and Machinery.
2. Water Supply and Sewerage.
3. Heating, Lighting, and Ventilating.

While the fourth division, D, is devoted to Personal and Domestic Hygiene. These main divisions are sub-divided into numerous sections, and, indeed, we may say that we find, as on former occasions, that the classification of the Exhibition is rather more elaborate than the contributions.

The exhibits with which we are principally concerned are naturally those in division C, but it is perhaps more convenient for our readers to follow the numerical arrangement of the stalls rather than the classification.

Stall No. 2 contains an excellent collection of exhibits by Messrs. Wm. Sugg & Co., Ltd., the well-known gas engineers of Westminster, who show a large number of their many appliances for gas-cooking, of which the "Confectioner" and the "Robert's" Griller are amongst the novelties; the former intended, as its name implies, for the use of confectioners, and the latter for restaurants. Messrs. Sugg have also taken advantage of the locality of the Exhibition to show their ventilators for torpedo vessels, which are a special application of the Sugg & Simmance patent "Continuous Up-draught" Ventilator, which is probably familiar to most of our readers. A good feature shown in one of the gas kitcheners is an oven with glass doors intended to obviate the necessity, or rather the tendency, of ordinary household cooks to constantly open the oven door to see how the cooking is going on and thereby losing heat.

The importance of really effective filters justifies the large Stall, No. 3, occupied by the Berkefeld Filter Company, of Mark-lane, who show numerous filters which seem to have been particularly successful in the thorough filtration of microbes.

At Stall No. 7, Messrs. Hughes & Lancaster, of London, exhibit a "Shone Hydro-Pneumatic Ejector," and a good and well-arranged show of various classes of sanitary fittings and plumbers' work is exhibited by the Portsmouth Water Fittings Company (Stall No. 12), and contains many well-known and approved types of apparatus, thus assisting in the educational part of the Exhibition.

Messrs. J. Tyler & Sons, London, have a very good show of specialities of their manufacture at Stall No. 14. Amongst the novelties are the "Weir" tip-up lavatory, arranged to shoot its contents direct into the waste-pipe, instead of into a retainer, as in the older forms of tip-up basins. The "Column" pedestal closet (which has before been described in these columns) is now improved by being made with a solid back. The "Pedestal" valve closet is a new introduction, and is a particularly neat and satisfactory combination, possessing the advantages

of both the valve and pedestal forms. The "Turret" closet is also a speciality, having the advantage of being raised from the floor, and capable of being fixed without being in close proximity to the wall.

In Stall 15 the well-known "Blackman" fan is exhibited, including one of those working by an electric motor contained in the construction of the fan itself.

At Stall 16 we have a show-case of "Carboline" disinfectants, exhibited by Mr. H. Ellison, of Cleckheaton, and, what is more interesting, an ingenious Automatic Disinfector for supplying small quantities of liquid disinfectant to flushing cisterns.

Messrs. Broad & Co. have a large collection of their drainage specialities at Stall 17, including their well-known white enamelled channel bends and traps for inspection and interceptor chambers. They also show some gratings of so-called rustless ironwork, but we fear that this long-sought-for article has not yet been found, as close inspection reveals on the specimens submitted some small signs of rust. There can be no doubt that the best of the processes now employed for preserving iron from rust require the very greatest care in their application to obtain good results.

Messrs. Doulton & Co., at Stall 20, have restricted themselves to a small exhibit of filters and water-softening apparatus.

Mr. C. G. Roberts, of Haslemere, at Stall 21, shows specimens of his rain-water separators, one with glass front to illustrate the working of these ingenious and useful adjuncts to a country house.

At Stall 22, The Rainbow Engineering Co., of London, show by plans and models of parts the system devised by Mr. C. H. Rosher, C.E., for heating the water of swimming-baths, which has been used very successfully in several cases, and particularly during the last winter at "Venice in London," to the complete satisfaction of Mr. Imre Kiralfy. The "Rosher" system consists generally of a forced circulation of the water by means of a "circulating heater," (or a "circulating pump," in connexion with a heater), so arranged as to draw the water from the bath at suitable points, and re-deliver it at or near the bottom of the bath at other suitable points. As a rule, the circulator is arranged to draw from the bottom of the bath, and also from overflow level as required, and the water is re-delivered through "spreaders," placed practically flush with the bath floor. Leaving the spreaders at a high velocity under pressure, the incoming water is distributed over the bath floor in the form of a thin layer or film, and, whether for the purposes of heating by convection or for agitation, the whole area of the bath is affected. As arrangements can be made for the filtration of the water at each withdrawal of the water, this system admits of great economy in the working of swimming-baths, whilst the temperature of the whole body of water is remarkably even, and there is no chance of bathers being scalded by the introduction of live steam or highly-heated water.

Moule's well-known earth closets are shown by the Moule's Patent Earth Closet Company of London (Stall 24).

Mr. H. Sully, of Nottingham, at Stall 26, exhibits some Noiseless Safety Pavement and Floor Lights, which closely resemble those of Messrs. Hayward Bros. & Eckstein, except that slips of teak are inserted in the iron frames between the lenses, whereby the "noiseless" character is obtained.

Messrs. C. E. Gittins, of London, have at Stall 29 some filters which possess distinct advantages, in that they are easily cleansed and recharged, whilst the taps are wholly of stoneware, with the exception of an india-rubber washer that does not come in contact with the direct flow of water. These taps being made in screw form by machinery are interchangeable, and thus particularly suitable for export trade. The same firm also exhibit their water-softening apparatus.

Messrs. T. Smith & Co., of London, show (Stall 31) a large collection of specimens of their manufactures of glazed stoneware for sanitary purposes, which are interesting, but not novel.

At Stall 41, Messrs. A. H. Ford & E. G. Wright, of Portsmouth, exhibit their scheme for the ventilation of sewers by the use of a separate pipe at the top of the sewer, and parallel with it, through which fresh air is supposed to travel, drawing with it the foul air of the sewer. With the aid of a jet, or other means of inducing a current, it seems that this system has some advantages.

The plumbers appear to be devoting most of their attention at present to two minor details: silent flushing cisterns and connexions of stoneware and lead pipes; and at Stall 42 we find Mr. E. Ward, of Clapham, with two flushing cisterns, "The Premier" and "The Warden," which have fairly solved the problem of noiseless action, and are besides well made and skilfully constructed.

At Stall 43, Mr. A. Angell, of the County Laboratory, Southampton, exhibits specimens of cement, made from sewage sludge and gas-lime, for which it is claimed that the utilisation of these two waste products would enable a corporation dealing with the sewage and gas supply of a town of 50,000 inhabitants to manufacture 5 tons of cement a day at a profit of 15s. a ton. It is not contended that the cement produced is equal to the best Portland cement, as the tensional strength is not equal to the best records, while uniformity in quality is decidedly lacking. The same exhibitor also shows his "Calortene" boiler coating, which has been employed at Portsmouth Dockyard with satisfactory results, and appears to save some 70 per cent. of the heat in boilers and steam-pipes,

Messrs. Quirk & Sharp, of Liverpool (Stall 44) have one of the joints for stoneware and lead pipes, to which we have referred, consisting of a split ring and rubber washer, which is a satisfactory arrangement.

At Stall 47, the Trott Patent Valve and Engineering Company, of Batterseа, have some excellent examples of their valves, which are well and strongly made, and consist of a sliding or swinging valve in a chamber covered with a screwed cap, or nozzle, the unscrewing of which facilitates the removal of the inner valve and the insertion of new asbestos or metal discs when necessary. The waste interlocking bath valves are particularly worth notice, and are so arranged that the waste valve cannot be opened without closing the inlet valves, thus preventing waste of water, whilst only one handle is required for controlling the hot, cold, or tepid water-supply and waste. Thus these valves are especially suitable for use in asylums and other public institutions.

Messrs. D. T. Bostel & Son, of London, at Stall 48, have besides their "Excelsior" closets and "Silent" flushing cisterns, some good forms of joint for connecting lead pipes to stoneware.

The next stall, No. 49, occupied by Mr. John Jones, of Sydney-street, Chelsea, is particularly interesting to the professional visitor by reason of the collection of various instruments for use in testing drains. The bag stopper, which is of proved utility for plugging drains of irregular shape and awkward form, is improved in detail. Then we have an expanding screw stopper, of which the special point is the provision of a hollow rubber ring instead of the usual solid ring, thus giving a much greater range of expansion. These stoppers can be obtained with indicator gauges attached, which greatly facilitate the testing of the tightness and also the fall of a drain. The most notable of the devices exhibited in this department is, however, the automatic pump for forcing smoke into drains and pipes, which by the use of clockwork obviates the necessity of keeping a man constantly at work as in most of the machines for the application of the smoke test. Mr. Jones has improved the form of his manhole cover, in which the inner cover is arched to utilise the condensation of water vapour for a seal, by providing another groove to form a second seal. We may here note that all the newest forms of manhole cover aim at the provision of a double seal in various ways, and this particular one appears to do so in as satisfactory a manner as any. For deep manholes the cover is made in two parts connected by chains, so that any drain air may be kept at a low level instead of filling the manhole. We have at this stall also an improved mica flap inlet in which the flaps are hung at the side instead of at the top, in order to obviate some of the disadvantages to which these inlets are subject.

Mr. E. R. Palmer, of Beckenham, has, at Stall 50, a good exhibit of large size automatic flushing apparatus for drains and sewers, made in sizes up to 36 in. diameter, which are admirable for their purpose.

Mr. Milton Syer, of Peckham (Stall 51), has amongst other of his manufactures, a new flushing cistern, the "Eidolon," which has the double advantage of being noiseless, and also disinfecting,—each discharge of water carrying a quantity of powerful disinfectant with it.

At Stall 52, the well-known manufacturer, Mr. George Jennings, of Lambeth, has a good display of some of his specialties in lavatories, improved bath-fittings, and closets.

The Water Carriage Engineering Company, of Mowbray-street, Sheffield, have at Stall 56, an exhibit of one of the best forms of trough-closet we have seen, together with a strong and simple automatic flush tank, both of which are eminently suited for rough usage.

Stall 62 is occupied by Messrs. Wheeler & Sons, of Notting Hill-gate, with their automatic ventilators fitted with cones inside the wind blades, which were noted in the *Builder* a short time back (vol. lxii., p. 454).

At the next Stall (63), Messrs. C. Kite & Co., of London and Glasgow, have a large exhibit of their self-acting ventilators, and other appliances which are amongst the best of their class.

We now come to a group of exhibits in the Heating and Lighting Class, in which we may first notice Stall 65, where Messrs. John Wright & Co., of London and Birmingham, have a good show of gas-stoves for both warming and cooking.

At Stall 66, James Stott & Co., of Fleet-street, exhibit their well-tried gas regulators, and the Stott-Thorp Reflex Sunlight, a large gas light of the regenerative type.

Stall 67 is occupied by the Gwaun Cae Colliery Company, of Rotherham, with specimens of anthracite coal, stoves suitable for the burning of which are shown at Stall 68, by Messrs. E. A. Cleeves & Co., of Great St. Helen's, London, and at Stall 69, by the London Warming and Ventilating Company, of Great Winchester-street. The difficulty of burning anthracite is, in each case, overcome by the employment of back draught or "Revertive" action.

The Eagle Range and Foundry Co., of Birmingham, have, at Stall 71, a very good show of "Eagle" ranges and fire-grates, of varying sizes, while at Stall 74, Mr. H. Heim, of London, has examples of the "Helios" and "Hestra" grates and stoves.

One of the most interesting exhibits in the heating section is that of the Economic Smokeless Fire Co., of London, who, at Stall 78, have some excellent kitcheners, arranged for burning the poorest class of fuel, and, at the same time, consuming smoke by drawing off the products of combustion at the bottom and back of the fire-grate.

Still continuing the numerical order of the catalogue, we note, at Stall 85, a well-built medical brougham, by Messrs. Linington Brothers, of Portsmouth, which finds its chief claim to a place in a Health Exhibition by the provision of ventilation, a very desirable feature in the confined cubical space of a carriage interior.

At the next stall, No. 86, Messrs. J. J. Thornton & Co., of Southsea and Brighton, have a collection of india-rubber goods, a class of article which, for wearing apparel, is to be avoided rather than adopted by seekers for health.

At Stall 87, the Bilton Company, of London, exhibit their hygienic tobacco-pipe, one of the latest of the never-ending attempts to prevent the fouling of these articles.

Stall 94 is occupied by the Rizine Food Co., who seem to be able to justly claim a place amongst hygienic exhibits for the advantages of their commodity, as illustrated in Mrs. Wright's cookery demonstrations.

Coming to Stall 102, we get back to the heating section, for here the Parkhouse Iron Company, of High Holborn, have some good specimens of kitchen ranges, of which the chief recommendation is their combination of the double functions of close kitcheners and open ranges. In the next stall (103), Messrs. H. Darwin & Co., of London and Glasgow, have a good series of gas cooking apparatus, from the smallest boiling-stoves, price one shilling, upwards. Their cooker is noteworthy for its fire-brick top, and the careful arrangement of boiling-jets to prevent the extinction of the flame by the boiling over of liquids.

Messrs. R. & A. Main, of London and Glasgow, show, at Stall 104, some of their many forms of gas cooking apparatus and models of some of the larger examples of their work for restaurants and other large kitchens, of which the firm make a specialty. We may mention that the gas cooking stoves and hotplates for oat-cakes used by Mrs. Wright in her demonstrations are supplied by Messrs. Main. The

School Board Cooker, 30 in. high over all, is specially designed for use by children in cookery centres, and arrangements have been made for practical demonstration by some of the Board School children of the town of its suitability for the purpose.

At Stall 111 the excellent disinfecting apparatus of Mr. Washington Lyon, of Peckham, is illustrated. By this apparatus clothes and other articles are disinfected by dry steam without injury to the most delicate fabrics and without unpleasant smells, while the disinfection is thorough and the apparatus is durable and economical in working.

A special microscope room has been arranged in which a loan collection of bacteriological specimens and various forms of microscope illustrate the use of this instrument in modern sanitary work.

In the grounds outside the Drill-hall Messrs. Humphreys have erected a galvanised iron building, in which the Royal Portsmouth and Gosport Hospital illustrate the working of a small hospital, even to the extent of providing a patient and nurse.

Also, in the grounds, the method of forming and using a military camp kitchen is demonstrated; while here also are the bulky exhibits of Messrs. W. Clemens, Abell, & Co., of Worcester, who show chain pumps, water and dust carts, and street-sweeping machines.

## AWARDS AT THE SANITARY INSTITUTE CONGRESS.

THE following awards of medals and certificates have been for objects exhibited at the Sanitary Exhibition in connexion with the Congress at Portsmouth. We give only those awards which are for inventions or articles within the class of subjects that are of direct interest to our readers:—

DIVISION B.—Hygiene of Special Classes, Trades, and Professions. — *Certificates:* C. Groom: a Square Tent for Garden. Humphreys, Limited: Iron Temporary Hospital Hut. Portsmouth Water Fittings Co.: Water Curtain for Public Places of Entertainment.

DIVISION C.—Water Supply and Sewerage, Class 2.—*Medals:* Broad & Co.: Enamelled Fireclay Water Cisterns. *Certificates:* Portsmouth Water Fittings Co.: Shanks' Enamelled Iron Bath; Shanks' Independent Spray and Plunge Bath. Broad & Co.: White Enamelled Fireclay Sink; White Enamelled Straight and Curved Channels for Inspection Chambers to Drains. The Trott Valve and Engineering Co.: Removable Valves for Hot and Cold Water Cocks; Combined Bath Valve, with Interlocking Gear for Waste. Geo. Jennings: Cabinet Lavatory Stand. Milne, Sons, & Macfie: Brass Syphon Traps. Coleman & Morton: Improved Tumbler Sanitary Cart. Water Carriage Engineering Co.: Flush Indicator. W. Clements, Abell, & Co.: Balanced Water Cart. Milne, Sons, & Macfie: Standing Waste and Overflow, with Trapping Bend for Bath. Water Carriage Engineering Co.: Automatic Flushing Syphon, with Tipping Bucket at Outlet. E. R. Palmer: Palmer's Automatic Flushing Syphon.

DIVISION C.—Heating, Lighting, and Ventilation, Class 3.—*Medals:* J. Greenall: Greenall's Steam Washer. *Certificates:* Eagle Range and Foundry Co.: No. 35 Eagle Regulator for Regulating Draught to Eagle Open Fire-grate; Indicating Damper to Eagle Range. S. S. Way: Terra-cotta Door and Window Jambs.

DIVISION D.—Personal and Domestic Hygiene.—*Medals:* Washington Lyon: Steam Disinfector. Morris Tube Ammunition Co.: Morris Circulating Principle of Water Filtration. *Certificates:* Berkefield Filter Co.: The Berkefield Filter. Jeye's Sanitary Co.: Jeye's Fluid. C. E. Gittins, Limited: Porcelain Screw Tap for Filter.

The judges desire to refer to the specimens displayed on the walls of the Exhibition of the record plans of the sewerage and house drainage of the Borough of Portsmouth, and to congratulate the Town Council on the way in which these plans have been kept up, and on the possession of such a valuable record, not only of the sewerage, but of the details of some thousands of house drains.

(*Signed*) ERNEST TURNER, F.R.I.B.A., Chairman.
E. WHITE WALLIS, F.S.S., Secretary.

## THE SANITARY CONGRESS.

THE thirteenth Congress of the Sanitary Institute commenced on Monday last at Portsmouth very successfully. The chief Magistrates of Southampton and Chichester, as well as the Mayor of Portsmouth, the Bishop of Chichester, the Bishop of Portsmouth, and all the local magnates, with the Duke of Connaught at their head, have either lent their names or are taking a personal part in the Congress.

The proceedings of the opening day included a formal reception of the members of the Congress at the fine Town-hall which the town has acquired; a luncheon of which some 150 congressists partook; the inaugural address of the new President, Sir Charles A. Cameron, the famous Irish sanitarian; and, lastly, the opening ceremony at the Volunteer Drill-hall, by the Lord Mayor in State. At the luncheon the Lord Mayor presided, supported by the Mayor of Southampton, Mr. James Lemon, C.E., F.R.I.B.A., &c.; Alderman Sir Wm. King; Sir Thomas Crawford, the retiring President; Sir Charles Cameron, the President elect, and an influential local committee. The Mayor (Alderman T. Scott Foster), after the loyal toast, proposed "Success to the Congress," and extended a hearty welcome to Portsmouth to all the members present, ladies not less than gentlemen. Portsmouth, he believed, was ahead of many of the largest towns in the country in sanitary matters. A great deal of money had been spent on drainage and other sanitary improvements in the town, but he was glad to say that the improvement in the health of the community had given an ample return. Sir Thos. Crawford replied to the toast, expressing a confident hope that the Congress of Portsmouth would be no less successful than that at Brighton two years ago had been, and if that hope were realised, the Sanitary Institute would have every reason to be satisfied. After the toast of "The Mayor and Mayoress" had been proposed by Sir Charles Cameron, and responded to by the Chief Magistrate, the company adjourned to the Grand Jury Room, where the new President delivered his inaugural address, of which we give the principal portion, dealing with the subject of

### THE VICTORIAN ERA, THE AGE OF SANITATION.

"From the earliest ages, since the people of these islands emerged from barbarism, some attention was given to the subject of public health, and a few enactments, more or less relating to the health of the people, may be found on the Parliamentary statute books and amongst the edicts of the sovereigns previous to the nineteenth century. Their provisions were, however, rarely enforced, and if all the Sanitary Acts passed before Her Majesty's reign were collected, they would form a volume of no great size. Let us see what the Victorian age of sanitary legislation and literature has produced.

The first important official report in reference to the health of the people was issued in 1842, under the title of 'Report of the Sanitary Condition of the Labouring Population of Great Britain;' it was soon followed by legislative action. A Factory Act was passed in 1844, and this was the first of the many general statutes more or less relating to the public health enacted during her Majesty's reign. In 1845 a Nuisances Removal Act was passed, and in 1848 the well-known Nuisances Removal and Diseases Prevention Act was put on the Statute Book. In 1866 a useful 'Sanitary Act' came into operation, and in 1872 was followed by a Public Health Act. The Common Lodging Houses Act of 1851 was the first that dealt specifically with the dwellings of the poorer classes of the community. These six Acts of Parliament have all been amended and extended,—some of them a great many times,—and they and the amending Acts constitute perhaps the most comprehensive code of sanitary laws ever enacted in either ancient or modern times. In addition to those Sanitary Acts, other important ones have been passed in relation to burial-grounds, mines, town parks, and open spaces, the adulteration of food and drugs, the diseases of animals used as food, the sale of milk, margarine, and poisons, the pollution of water, trade nuisances, the construction and management of bakehouses, the storage of explosives and petroleum. Numerous private Acts of Parliament, obtained by local authorities, are either altogether sanitary or contain clauses relating to sanitation.

Numerous as are the volumes of sanitary laws, they are exceeded by those containing the evidence in relation to sanitary matters given before Parliamentary Committees, Royal Commissions, and 'Departmental' Committees, together with the reports thereon. These 'Blue Books' constitute an immense library, in which voluminous details are given in relation to the dwellings, occupations, food, water supplies, diseases, and medical relief of man; and to the hygiene and municipal administration of towns. The Blue Books issued from the Medical Department of the Local Government Board and the Army and Navy Medical Departments are numerous and valuable.

A third department of sanitary literature consists of the annual and special reports of the Medical Officers of Health, which may be numbered by thousands. They are the annals of sanitary progress. Until very recently they dealt only with the health of towns; but in the future we may expect valuable reports on purely rural districts from the County Medical Officers of Health. Until now nothing worth boasting of has been done to improve the status of health in the open country; but the last Local Government Act has created for the rural districts sanitary organisations similar to those which have long existed in towns. We might venture to hope that under the new *régime* of County Councils, the well-known rural death-rate of 17 per 1,000 may be reduced to 16 or less.

Not so numerous as the reports of Medical Officers of Health, but not less interesting, are the Transactions and Journals of the Sanitary Institute and similar organisations. The Journal of the Statistical Society is rich in sanitary literature. The Transactions and Journals of medical sanitary societies and of the Public Health Sections of medical associations contain numerous contributions to hygienic literature.

Public health has its representatives amongst the periodicals of the day; for example, the *Sanitary Record*, *Hygiene*, the *Health Record*, &c. It has also special departments assigned to it in most of the purely medical journals. In May of the present year a welcome addition to our periodical literature appeared in the shape of the *Journal of Pathology and Bacteriology*, in which, judging by the names of intending contributors on its title-page, we may expect some brilliant writing on the causation and prophylaxis of microbial diseases.

Prior to the Victorian age there was only one really comprehensive and philosophical book on Hygiene published in Great Britain; this was the 'Philosophy of Health,' by Dr. Southwood Smith, which appeared in 1838, and which still may be read with advantage. For some years past dozens of books, more or less relating to public or private hygiene, issue annually from the Press; many of them of large size, as for example, the ponderous book by Stevenson and Murphy, issued in the present year, and which, though only the first volume of a treatise, numbers 1,018 large pages.

There is no more convincing evidence that this is the age of sanitation than the fact that the books on the subject published within the Victorian era would furnish a large library, whilst those of an older date would hardly garnish a single bookshelf.

The higher estimation of preventive medicine, which lately prevails amongst the professors of the healing art, is shown by the recent institution of degrees, diplomas and certificates in Public Health, State Medicine, and Sanitary Science by the universities and medical and surgical corporations. I am proud, as a citizen of Dublin, to be able to state that the university of that city was the first to create a diploma in state medicine. This was in the year 1865. Its example has been followed by all the other medical licensing bodies, and there are now some hundreds of holders of sanitary qualifications. I may also be permitted to say in this connexion that the Professorship of Hygiene, which I hold in the Royal College of Surgeons, Ireland, was the first instituted in Europe, with, I believe, one exception, namely, that in the Medical School of Montpelier. The Chair of 'Hygiene or Political Medicine' of the Irish College of Surgeons was established in 1844.

Quite recently some of the medical licensing bodies have decided to require of candidates for their ordinary diplomas evidence of study in sanitary science; and for the Public Health Diplomas it must be shown that the candidates have worked in a chemical sanitary laboratory,

and have studied the duties of a health officer under a Medical Officer of Health. It is a good sign of the times to find that the Medical Act of 1887 made Public Health Diplomas registrable qualifications.

In the future no one will be eligible to act as Medical Officer of Health for a town of 50,000 inhabitants and upwards unless he holds a registrable qualification in public health.

Before the Victorian era there were few sanitary laws worth administering, and consequently no *raison d'être* for local boards or officers of health. Some drainage works were carried out by the town and country authorities, and a few attempts were made to improve the water supplies of urban districts. The filth produced in towns had to be got rid of in some way; on the other hand people were taught to be too economical in the combustion of fuel by the imposition of a rate on hearths, and they were encouraged to exclude daylight by having to pay a window-tax.

The insanitary state of British towns was made painfully evident by the invasion of cholera in 1831. According to official statistics there died from cholera in 1831-2, 31,376 persons in England and Wales, and 21,171 in Ireland. In 1848 cholera re-appeared in England and Wales, and destroyed 53,273 lives. In 1853, 20,097 deaths were ascribed to cholera, of which about one-half occurred in London. In 1866 it re-appeared, but with less fatal results. The deaths in England attributed to it were 14,378, in Ireland 2,501, and in Scotland 1,470; total 18,149. This lessened mortality was not due to the milder character of the disease, but rather to the towns being less filthy than they were during previous visitations. On the Continent so virulent and widespread was cholera at this time that it is computed it caused more than one million of deaths. In Italy alone it carried off 120,000 victims; and in the small countries of Holland and Belgium it caused 50,000 deaths.

When cholera first appeared in Dublin in 1831, the sanitary state of the city was deplorable, and consequently 5,632 out of a population of a quarter of a million perished. When it came again to Dublin in 1849, the condition of the city was not so bad, and the victims to cholera were only 1,664. In 1866 Dublin was for the third time visited by cholera, and on this occasion 923 deaths were caused by it. Sanitary matters were in 1866 better than in 1849; and were the disease again to invade Dublin, I venture to hope that it would be much less fatal than in 1866. I think that in British towns generally Asiatic cholera will not again cause such ravages as it did in 1831, 1848, 1854, and 1866. I am not very apprehensive that the epidemic which now rages on the Continent of Europe,—in which it has appeared seventeen times since 1829,—will extend to our islands.

It was probably the ravages caused by cholera in 1831-2, and more especially in 1849, that first awakened the public to the necessity of improving the hygienic conditions of towns. A committee appointed to inquire into the sanitary condition of the Metropolis reported in 1848 that no substantial improvement had taken place in the state of the back streets, lanes, alleys, and courts since the cholera epidemic of 1831-2. The committee expressed an opinion that if the disease were again to visit London, it would spread as extensively and prove as fatal as it did in the former visitation. This prediction was, unfortunately, but too soon verified; but in the meantime the era of sanitary activity was initiated by the passing of the Public Health Act of 1848. This Act, though it permitted and did not compel sanitary reforms, was a useful one, and was availed of to some extent, as was also the case with the Local Government Act of 1858.

An important agency in promoting sanitary legislation were the valuable reports,—issued in 1842 and 1845,—of the Commission on the Health of Towns.

The powers conferred upon health authorities, at first almost invariably permissive, gradually became more of a mandatory character. What a difference, is there not, in the significance of these two words 'shall' or 'may' in a sanitary statute! The exercise of the powers vested in local authorities has resulted in the expenditure of an enormous sum of money. It has mainly been employed to secure pure water supplies, to construct drains, to pave streets, to thin out densely-inhabited places, to clear unhealthy areas, to erect dwellings of a healthful kind for the working classes, to provide public abattoirs, baths and washhouses, town parks and open spaces, to build and maintain fever hospitals, to adopt improved methods of filth disposal. The maintenance of staffs of sanitary officers has caused a large addition to the taxation of towns. Formerly very few towns were provided with even a single Inspector of Nuisances. In 1864 Dublin had but one sanitary officer, now it has nearly fifty. It must be admitted that the administration of the sanitary laws involves a substantial outlay of money. It is, however, money well expended. It gives a good return in the form of a lessened sickness rate and reduced mortality. It diminishes pauperism, by preserving the health of the working man. The death of the labourer by a preventable disease may have the effect of sending his children into the workhouse. Sanitation has greatly reduced the mortality caused by preventable diseases. We pay enormous sums for an Army and Navy to preserve us from foreign foes, to protect our liberty, property, and lives. But there are foes our brave sailors and soldiers cannot defend us from; enemies that kill annually far more than ever fell upon the battlefields during our greatest wars. These enemies are the infective diseases, which are not necessarily concomitants of human nature, and the attacks of which may be, and some day shall be, warded off. We require an army of sanitarians to guard us against those deadly foes. They who vanquish them achieve victories far more glorious than ever warrior won. They are triumphs which are not followed by the groans of the wounded, the wail of the widow, or the cry of the orphan. The trophies of the conquest are increased health, life, and wealth to man.

As the soldier to be effective must be skilfully trained to the use of arms, and grounded in the knowledge of tactics and strategy, so should the sanitarian be thoroughly instructed in the principles of hygienic science, and capable of using the necessary instruments of research. It is not long since every medical man was considered perfectly competent to act as an officer of health, but now the model medical officer of health is expected to know more than the ordinary practitioner. He is expected to be familiar with the use of meteorological instruments, to have some knowledge of geology, to understand sufficient engineering as to know how sewers and drains should be constructed, trapped, and ventilated. He may be called upon to suggest how the noxious effluvia from certain factories may be rendered innocuous. He is often requested to pronounce as to the fitness or unfitness of the flesh of animals as food for man, and he cannot do that properly if unacquainted with the diseases of those animals. Not unfrequently he acts as an analyst, and examines potable water, determines the amount of carbonic acid in the air of places suspected of being unhealthy, and does other sanitary-chemical work. As yet he has not been called upon to do much as a bacteriologist, but in the immediate future the candidate medical officer of health will be expected to have a thorough knowledge of the pathogenic microbes; to be able to determine the number of micro-organisms per cubic centimètre of water, and to be an adept in the 'cultivation' of bacteria, bacilli, spirilla, *et hoc genus omne*.

The Medical Officer of Health will be something more than a physician and surgeon—he will, in a sufficient degree, be a bacteriologist, chemist, a veterinarian, a geologist, an engineer, a statistician, and, so far as the sanitary statutes are concerned, a lawyer. Already several Medical Officers of Health have taken the barrister's degree.

Until quite recently there were no special arrangements made in the medical schools for teaching sanitary science; but this defect is being remedied, especially as regards the sanitary analysis of air and water, and the chemical and microscopical examination of food and drugs. Courses of lectures on hygiene and State medicine are also delivered, but at present not in all the medical schools. On the Continent bacteriological laboratories have been established in nearly all the universities and seats of medical education, and in the great Pasteur Institute at Paris the methods of identifying and 'cultivating' microbes may be studied. In these countries there is no great institution altogether devoted to researches into the intimate nature of those organisms, invisible to the unassisted eye, apparently almost without structure, yet endowed with a virulent potentiality rivalling that of strychnine or prussic acid. How marvellous, is it not, that we discover upon the confines of the visible world the causes of some of the most fatal diseases of man and of his subjects in creation.

There are few natural phenomena more wonderful than the enormous dynamic effect produced upon organised matter by these microscopic objects. A few, perhaps even one, of them introduced into the body of the largest animal may quickly raise its temperature and deprave its vital functions, disorganising the whole living mass, which exceeds in dimension its enemy by countless billions. Shakespeare, whose genius was prophetic as well as sublime, anticipated the modern description of infective matter when he spoke of it as that

> '——Whose effect
> Holds such an enmity with blood of man
> That, swift as quicksilver, it courses through
> The natural gates and alleys of the body,
> And with a sudden vigour it doth posset
> And curd, like eager droppings into milk,
> The thin and wholesome blood.'

Some provision for the study and teaching of bacteriology has been made by Cambridge University, the Colleges of Physicians and Surgeons, London and Edinburgh, the College of State Medicine, the Brown Institute, and, but to no great extent, in a few other places. We have no place which can be compared to the Pasteur Institute in Paris; it is the largest and best equipped bacteriological laboratory in the world. The British Institute of Preventive Medicine, established in 1890, proposes to found a bacteriological laboratory and accessories, on a scale equivalent to that of the Pasteur Institute. For this purpose it asks the rich and generous British public to subscribe 100,000*l*. Some handsome donations, including one of 2,000*l*. from Mr. Mond, have resulted from this appeal; and let us hope that British philanthropy, to which we are indebted for many noble gifts to the nation, will endow an institution, the objects of which are eminently for the benefit of man.

Hardly less important than the Medical Officers of Health and the Medical Inspectors of the Local Government Board are the rank and file of our sanitary army,—the Inspectors, or rather *discoverers*, of Nuisances. Formerly anyone was considered competent to do the work of the Sanitary Inspector, and persons who had been failures in other walks of life were often provided for by appointing them to be Nuisance Inspectors. This happily is now as a rule an exploded practice. It is realised that the person who has to discover sanitary defects in dwellings, public institutions, factories, schools, and other places should have some acquaintance with the laws of health. The Sanitary Institute never did a better thing than the institution of their certificates for Inspectors of Nuisances, and also for Local Surveyors. Since 1877 no fewer than 1,312 candidates for the sanitary certificate have been examined, of whom 825, or 63 per cent., were successful. During the same period 78 local surveyors received certificates, and 113 were unsuccessful.

During the Victorian age many millions of money have been spent in the execution of sanitary works, and in the maintenance of a legion of sanitary officers. Have the results of this vast expenditure of money and human labour been such as to satisfy us that it has not been a waste of our pecuniary resources and our time? Do they encourage us to further outlay and increased exertions? I think both queries may be answered affirmatively. That money spent to improve the sanitary condition of places has not always been judiciously laid out is quite true, but the same may be said of expenditure for most other public purposes. It must, moreover, be admitted that the provisions of many of the Acts relating to health have not been fully carried out, and that many local sanitary authorities, especially in rural districts, have lamentably failed to perform the duties, whether permissive or mandatory, entrusted to them by Parliament. It would not be difficult to discover places where the sanitary statutes are almost or wholly dead letters. They would indeed be dead letters in more places than they are were it not for the powerful influence exercised upon public opinion and on the conduct of the authorities by such organisations as the Sanitary Institute, and by the pen and voice of earnest sanitarians. There are hundreds of towns and villages in these islands which are still unprovided with proper

arrangements for drainage and filth disposal, and which are dependent upon scanty supplies of water, often of bad or inferior quality. On the whole, however, it must be admitted that the sanitary powers confided to the local authorities have been largely put in force. Let us see what good has resulted therefrom.

I do not propose to institute, except in the briefest manner, comparisons between the England of to-day and the England of a century or two ago. From 1700 to 1750 the death-rate in London was so high that population stagnated. In the former year the inhabitants numbered 665,200, and in the latter year 653,900. During this period the deaths were in the ratio of about 1 per 30 persons living. By 1801, the population had crept up to 777,000 and the deaths had fallen to 1 in 41 persons living. This great improvement in the state of public health in London was not, except in a trifling extent, the result of sanitary legislation. People were becoming more enlightened on many matters affecting their health, partly owing to a more general knowledge of chemistry, physiology, and other sciences relating to man and his surroundings. When those entrusted with the conduct of public affairs became aware how much the health of people was affected by bad water, by foul emanations from cesspools, and by too great a density of population, they began to secure supplies of pure water, to construct proper house-drains and street and house sewers, to remove systematically filth from houses, and to widen streets. The promulgation of the natural laws of health preceded the enactment of laws of health by the State. Jenner's discovery of prophylaxis in small-pox had for its corollary the vaccination laws. The chemical analysis of water was the basis of Acts of Parliament relating to water and rivers.

Until about forty years ago common-sense was the only motive power which impelled sanitary reforms in London and elsewhere. It was not inoperative, for early in this century the grosser defects in public and private hygiene had been recognised, and, to a great extent, remedied.

In Rickman's Report to Parliament on the Census of 1811, he gives the following estimates of the death-rates in England:—

| | | | | | |
|---|---|---|---|---|---|
| In 1780 ..... | 1 death | per | 40 | persons | living. |
| „ 1790 ..... | 1 | „ | 45 | „ | „ |
| „ 1800 ..... | 1 | „ | 47 | „ | „ |
| „ 1810 ..... | 1 | „ | 49 or 50 | „ | „ |

If these estimates are reliable, it would seem that after the great improvement in the public health in the latter part of the eighteenth and early portion of the nineteenth century no sensible change for better or worse took place for about half a century. According to Rickman, the death-rate in 1810 would be about 20 or 21 per 1,000 persons living.

In Dr. Newsholme's excellent work on "Vital Statistics" he gives the death-rate for males in the period 1838-1854 as 23·28 per 1,000 males living, and the rate for females at 21·65. It would therefore appear that the mortality of the population had increased as the century grew older. Probably the earlier statistics, collected before the Act for the registration of births, deaths, and marriages, were not quite accurate; no doubt some deaths escaped record. It would, however, seem that from 1810 to 1854,—making some allowance for defective registration,—there was no reduction in the death-rate. Even if we take the period 1851-60 we find no improvement: the deaths were in the ratio of 22·25. In 1861-70 the rate was 22·5, or 0·25 more than in the previous decade. It must, however, be borne in mind that from the beginning of the century population was increasing rapidly in the towns,—which must always, at their best, be less healthy than the country,—whilst in the rural districts population remained stationary or declined. It was therefore something to boast of, that although the towns of England were increasing in population at the rate of from 200,000 to 300,000 annually, the death-rate of the whole country had not sensibly increased.

In 1872 a Public Health Act was passed, which was amended and improved in 1875. This Act has been one of the most valuable ever passed, and to its operation must be reasonably attributed the improvement of the public health during the last two decades.

During the ten years ended in 1850 the mean annual death-rate in the Metropolis was 24·8 per 1,000 persons living; in 1851-60 the rate was 23·4, and in 1861-70 it was 24·1. During these thirty years there was no marked improvement in the sanitary state of London. Now comes the epoch of sanitary activity: in the period of 1871-80 the death-rate fell to 22·5, and in the decade ended in 1890 it further declined to 20·5, or 4·3 below the rate for the period 1841-50. If the death-rate in Greater London had been as high during the years 1881-90 as in the period 1841-50 nearly 50,000 more deaths would have taken place.

Early in the century the provincial towns were with few exceptions more insanitary than London. In reading the local literature of these places one often comes across descriptions of the abodes of human beings which are almost incredible, and which happily would now apply to very few English towns. In a pamphlet entitled 'Religion and Crime,' by Mr. John M. Morgan, and published by Longmans, London, in 1832, a dreadful description of Bristol is given. The author states that 566 families occupied each only *part of a room*, and that 2,224 families lived each in a single apartment. In a report upon the sanitary state of Nottingham, in 1839, by Mr. Falkener, it is stated that there were between 7,000 and 8,000 houses in that town placed back to back, without any through ventilation and unprovided with the proper appliances of civilised life. It is not surprising that in Nottingham 99,017 cases of fever occurred in the years 1835-6 and 7; but it is surprising to find that notwithstanding the acknowledged unhealthiness of back-to-back houses nearly 10,000 of them still exist in Manchester: need we then wonder that the mortality of the inhabitants of that great city exceeds that of every other of the great towns of England?

Mean annual death-rate in England and Wales:—

| Period. | Males. | Females. | Total. |
|---|---|---|---|
| 1841-70 ..... | 23·3 ... | 21·5 ... | 22·4 |
| 1871-75 ..... | 23·3 ... | 20·7 ... | 22·0 |
| 1876-80 ..... | 22·1 ... | 19·5 ... | 20·8 |
| 1881-85 ..... | 20·5 ... | 18·3 ... | 19·4 |
| 1886-90 ..... | 20·0 ... | 17·8 ... | 18·9 |
| 1891 ..... | 21·5 ... | 19·0 ... | 20·2 |

In 1851-60 the death-rate in large towns was 24·7, and in the country 19·9. In 1888-91 the rate in the towns was 20·4, and in the country 17·5.

The year 1891 was an unhealthy year, as will now and then be the case; but even in that year the mortality was much below that of the period 1841-70. If it were equal to the mean rate for that period there would have been 63,749 more deaths during the year.

The low death-rate in England is all the more remarkable when we consider the very large proportion of the population located in towns. In 1892, 18,931,070 persons lived in towns and 10,472,276 in the country; total, 29,403,346.

Whilst the death-rate of London has been declining the population of the great City has been increasing and concentrating. In 1841 the density of its population was moderate, *i.e.*, 25 persons per acre; but in 1891 there were 56·5 persons per acre. Large and dense populations are, as a rule, more unhealthy than small and widely-scattered ones. In London the unfavourable influence of the closer approximation of its inhabitants is much more than compensated for by the great improvements effected in the general hygienic conditions of the City."

The address was listened to with marked attention and was much applauded. At its close Alderman Sir William King proposed a vote of thanks, and Mr. Lemon (Mayor of Southampton) seconded it, the latter expressing a firm conviction, with regard to the apprehensions of a cholera epidemic, that England has less to fear from it than any other country in the world.

### *Sectional Meetings.*

The sectional meetings commenced on Tuesday at 10.30, divided as follows:—I. Naval and Military Hygiene, presided over by Inspector-General J. D. Macdonald, M.D., &c., &c.; II. Medical Officer of Health, presided over by Dr. Chas. Kelly, M.R.C.P., at the offices of the Gas Company; III. Municipal and County Engineers, presided over by Mr. H. Percy Boulnois, M.Inst.C.E., at the Water Company's offices; IV. The Sanitary Inspectors, presided over by Prof. A. Wynter Blyth, at Victoria Hall; and V. Domestic Hygiene, presided over by Lady Douglas Galton, at the Town-hall, where in the evening a lecture was delivered by Sir Thomas Crawford, on "English Homes."

### *Municipal and County Engineers.*

The President of this section, Mr. H. P. Boulnois, who was formerly Borough Engineer of Portsmouth, in opening the proceedings, expressed great satisfaction at finding himself present at a Sanitary Congress held in that important and prosperous borough, where so many years of his private and professional life had been spent. It was the first time in the history of the Sanitary Institute that a Conference of that kind had been held, and he trusted the new departure would be fraught with good results. During the reign of Queen Victoria each successive Parliament seemed to have emulated its predecessor in passing Acts to confer extended powers on the local governing bodies with a view to meet the sanitary requirements of the nation. That increase of powers had undoubtedly necessitated the educational advancement of the executive officers of these authorities, and he ventured to believe that amongst these officers the advancement of the Municipal and County Engineers in professional knowledge and skill had fully kept pace with the times. The recent visit to this country of that terrible scourge, cholera, had shown the value of the sanitary work which had been undertaken, and the vigilance, skill, and unwearied zeal of those brother officials, the Medical Officer of Health and the Sanitary Inspector. Although the cholera had been amongst us, it had been unable to take root. Good water, efficient sewerage, proper scavenging, plenty of air and light had been too much for it, and such a disease could never again be an epidemic in this country, thanks to our sanitary works and precautions. Much progress had been realised in the past, but there still remained much to be accomplished.

The principal subject brought forward after the address was "Town Refuse and Refuse Destructors," by Mr. C. Jones, M.Inst.C.E. (Ealing), but a brief paper on "Street Gullies and Road Cleansing" was also read for Mr. W. B. G. Bennett, A.M.Inst.C.E. (Southampton). The growth of towns, the progress of sanitary science, and the vigilance of Sanitary Authorities, said Mr. Jones, rendered it more difficult and much more costly to get rid of refuse than formerly, and the difficulty was felt in foreign capitals, like Paris, equally with our own metropolis. The day was, happily, past when refuse could be dumped down into the nearest hole or on the site of some new street or new building, and health considerations forbad its open passage for long distances through populous streets. The contents of the dust-bin being so largely composed of combustible material, the cremation of refuse would naturally occur to the mind, but it is less than a score of years since a suitable crematory was devised. In 1876 Nottingham made trial of Fryer's Destructor with encouraging results, and three destructors of this type were built. The paper referred to the improved types of cremators since brought out and described, particularly the construction of the "Perfectus" of Mr. Warner, the "Destructor" of Mr. Whiley (Manchester), and that of Mr. H. P. Boulnois, the President of that Conference. In all, the principle was the same, the refuse to be destroyed being conveyed by various methods to the top of a tube or chamber, there to be tipped on a declining surface, from which it found its way into the furnace. After refuse has been some time exposed to great heat, not less than from 1,000 to 1,500 deg. Fahr., three-quarters of its weight has been dispersed, and the residuum was a a hard clinker and fine ashes, about one-quarter the original weight of the refuse. The noxious elements were driven off, with no deleterious effects, when a Fume Cremator was used with the older type of destructor. A material not only inoffensive but useful was left, and in the process enormous heat, capable of generating vast sources of power, was developed, which if utilised must greatly reduce the cost of this method of disposing of refuse. With the "Fume Cremator," a chamber placed between the furnace and the chimney-shaft, the sludge of roads and even sewage sludge could be got rid of without the slightest nuisance being caused, because everything was instantly decomposed by the gases which, perforce, pass through the cremator chamber. In the best types of "destructors" the heat was turned into power. At Southampton, pumping machinery is worked, electricity is generated, and dynamos (for the electric light) are driven; and it was just this utilization of heat to pro-

duce power that most fascinated the speaker at the Conference on Tuesday. The 2,500,000 tons of sewage produced annually in London would have made an immense reduction in the huge coal bill incurred at the Outfall Works, Crossness and Barking, had they been utilised in a destructor. The total cost of the process, including repayment of capital, &c., was computed at 3½d. per ton treated.

In the discussion which followed, in which the President, Messrs. Mawbey (Leicester), Boulton (Burslem), Weaver (Kensington), and other members took part, the reduction of cost by the utilisation of the heat was the principal point under consideration, and many valuable suggestions were thrown out. A cordial vote of thanks was accorded to Mr. Jones for the paper.

*The Sanitary Inspectors' Conference.*

A numerously-attended Conference was held in the Victoria Hall, at which Professor A. Wynter Blyth, who presided, delivered the following address in opening the proceedings:—

The Sanitary Institute has at length attained its proper position. It is confessedly the chief society in the kingdom having for its main object the furtherance of all knowledge relating to the prevention of disease; it watches over and promotes health legislation; it encourages and rewards invention, by its Museum, by its Exhibitions, and by its Congresses; but, according to my idea, its chief claim for continued and prosperous existence is its great services in hygienic education. The Institute is the first body which ever organised permanently educational lectures with the express purpose of giving the necessary technical knowledge to Inspectors. These educational courses have not been confined to the metropolis, but have been established in nearly all the great population centres, and most of the County Councils have been induced to set aside a portion of the Education Grant for that purpose; nor have the advantages been confined to Inspectors. In each instance a fair number of the general public has attended. The results of this general diffusion of accurate knowledge on the prevention of disease are incalcuable, for the fact cannot be too widely accepted, that sanitary laws that are in advance of the average mental culture of the people are so many dead letters. In Russia, in Turkey, in Spain, and many other parts, it would be quite possible to enact laws superior to our own with regard to the prevention of disease, but the sanitary condition of the countries would not be improved, to a great extent, for hygiene begins in the household; it must be imparted by parent to child; its precepts must be lisped at the mother's knees; and piped in infant school; then, and then only, will the sanitary officers of any country get the hearty co-operation of the people. The Institute was also the first body to give practical embodiment to the idea that candidates for the post of Inspector should be tested by examination; it is at present the only body the certificate of which is recognised by the Local Government Board. It is a matter of general knowledge that other examining bodies are in existence; as yet they have not received official sanction, and whether they will receive it I know not; but from the history of the medical profession this fact can be learned—that it is not to the interest of Inspectors to multiply examining boards. There are some thirty or forty bodies which are capable of granting a legal qualification to practise medicine in the three kingdoms; the result is that a young medical man thinks he is bound to multiply his degrees; he is not satisfied with the qualification of the physicians and surgeons, but considers that the more letters he has after his name, the better the chance of practice or of appointments. He passes a great portion of the best years of his life in studying for examinations, and spends no small portion of his substance, the end result being neither to the advantage of himself nor to that of the community. The only class of persons which are benefited is the class of professional examiners. Speaking as one of the class of examiners, it is to my personal interest to promote and foster the multiplication of all examining boards; but speaking as one of the class of Sanitary Inspectors, for each health officer by virtue of his office is a Sanitary Inspector, I declare no less emphatically that this multiplication is against the best interests of the Sanitary Inspectors. How the medical student sighs for the one portal system, and how the medical profession as a whole has endeavoured, and endeavoured in vain, to evolve one examining body from the chaos of qualifying bodies, is to be read in the medical history of the last ten years.

Should the Inspectors sacrifice their interests to satisfy the restless ambition of a few discontented spirits, it is easy to forecast the result. Within a little time there will be some dozen examining bodies, and the ambitious Inspector will not be satisfied with the certificate of one of them, but he will, like the young medical man, take two or three, this being a mere question of money. The certificates themselves will be unequal in value, some, as in the analogous case of medical degrees, will be of high value, others of low value; but neither the public nor the local authorities will appreciate these differences. A man holding a certificate of the lower kind will be equal in their eyes, so far as qualification goes, to the certificated man who passed through the examination of the stricter. Besides which the multiplication of examining bodies has of itself a tendency to increase the number of certificated men; and the greater the number of certificated men the greater competition for appointments and the greater the competition, other things being equal, the lower the salary. The progressive stiffening of the Institute's examination has had the good effect of greatly diminishing the number of applicants for an advertised berth. In the old days every clerk, plumber, builder, and out-of-work loafer would answer an advertisement, but the condition enforced by the majority of local authorities that a man must have the certificate of the Institute, has altered all this. Now the local authority, thanks to the Institute, has only to select the man whom they think most suitable from a comparatively-speaking small and select body. Having been placed by virtue of a qualifying examination on a similar basis to that of the pharmaceutical chemist, the modern Sanitary Inspector has a definite position to maintain; in his hands to a great extent lies the future of the public health service, and therefore I will next make a few observations on the subject of "conduct." In the sense I am using the term "conduct," it is almost synonymous with "manners." Conduct is distinct from ability, and from even morality. Talent is an endowment of both, which may be cultivated, but never acquired. Good or bad morals are also, to a larger extent than teachers of religion will allow, engrained and built into the system; the possession of ancestors the majority of whom have been good and virtuous, healthy minds, and healthy bodies, is a gift of value unsurpassed. But good manners are capable of being acquired by all, and a man is judged by those with whom he comes into casual contact in the daily routine of duty, almost entirely by his courtesy or otherwise. Whether the large powers of entry into the Englishman's castle, and the powers of interference with personal liberty of the subject which the Inspector possesses, can be beneficially increased will depend upon the conduct of Inspectors individually and collectively. Power can only be safely given to those who prove themselves fit to exercise it. Of all nations the English are most tenacious of the principle of the privacy, even the sanctity, of the home, and this principle is outraged if an official enters without knocking, without permission, and with hat-covered head. Let a home be a room with dirt-begrimed windows, tenanted with squalor and misery, the furniture a broken chair, the bed a heap of rags, yet I advise Inspectors as a matter of policy to use due ceremony on entering, such as they would on entering the threshold of the clean and wealthy. Emerson took his hat off to a flower as the emblem of beauty, and an outward sign of homage may well be given, not out of respect to the rags or the squalor, but as a recognition of the principle of home sanctity. The propriety of a silent tread and soft voice in the presence of sickness or sorrow is too obvious to need more than mention. Speech is silver, silence is gold says the proverb, so it is only exceptional that an Inspector requires to harangue sinners against statute or by-law. His duty begins with observation, it ends with report. Censure, where there should be commendation, abuse from owners, temptation from those who would veil bad material or work with a bribe, and, worse than all, false accusation, are troubles some or all of which the Inspector is likely to encounter, and demand the exercise of the utmost patience, the utmost self-control. A man's temper is not always self-governable, but self-control by continual exercise can be certainly improved. In a dispute it must be remembered that the man who preserves has an advantage over the man who has lost his temper, similar to the advantage of a sober over a drunken man. If the soft answer that turns away wrath prevails not, take refuge in silence, for it takes two to quarrel. The Inspector's qualities are only tried by "accusation." I regret to remark that the majority of local authorities have shown themselves incapable of making just inquiry into charges against officers. Whenever a local authority has to investigate a charge so serious that it may involve loss of character or office, the authority is practically a court of justice, and should never forget the elementary principles of justice,—viz., that the charge should be definite, not general and indefinite; that the accused should have a copy in writing of the charge; that he should be present during the whole time that witnesses for or against him are examined; that he should have an opportunity of cross-examining the witnesses, and ample facility for preparing his defence. So little have these principles been followed, that it has happened more than once that a local authority, actually in the absence of the officer, has investigated a charge, considered it proved without hearing the other side, and passed a vote of censure.

[*Continued on p.* 228.

## Illustrations.

### DESIGN FOR FRIEZE; "AMORES CAPRARII."

THIS is a reduced lithograph from the large drawing by Mr. John S. Babb for a frieze, which formed a conspicuous object at one end of the architectural room of the Royal Academy this year. The artist writes:—

"My idea as regards the design of youthful figures, 'Amores Caprarii,' was that it should form one of a series of panels, with analogous subjects ('Amores Pastores,' &c.), for the frieze of a large hall or room, treated in the colour shown in the original drawing.

I have wished to make it thoroughly architectural in character, using the plain ground for the figures, as I think the modern tendency to regular picture treatment is unsatisfactory in association with architecture.

The distance from the eye at which a frieze is necessarily placed makes the plain ground the only one, especially in a climate like ours, which reveals the designs sufficiently; and it affords the fullest scope to an artist's sense of grace or form.

This drawing should have been executed, had it suited me to do so, to at least twice its present scale—viz., 14 ft. long, instead of 7 ft., for the place it occupied when exhibited.

The actual frieze would, perhaps, be best executed in Gambier Parry's spirit fresco; but, for economy, oil on canvas, with gum elemi flatting might be used; a method the stability of which, however, is perhaps questionable."

### ST. BARTHOLOMEW-THE-GREAT, E.C.

THE new transepts we illustrate this week will practically complete, with the exception of the Lady-chapel, the work of restoration of this church commenced by the Rev. W. Abbiss in 1866 under the direction of Professor T. Hayter Lewis and Mr. Slater, and continued by the Rev. W. Panckridge and the present rector, the Rev. B. Savory. The original transepts were both destroyed by fire—that on the south side being still in existence in the early part of the present century; the new transepts, therefore, cause no disturbance to the old work, but by providing abutments to the central arches add to their stability, and have merely involved the removal of modern walls hurriedly built to keep out the weather after the destruction of the original transepts. These were considerably deeper than the present ones, but to have rebuilt them on the old lines would have involved the purchase at great cost of neighbouring properties, and as additional space is not required they would have only added to the present heavy cost of heating and maintenance.

The plan shows the arrangement of these transepts; that on the south was completed and opened last year, that on the north is in

# - CHURCH OF ST BARTHOLOM

## — GROUND PLA

10 5

- STYLES —

NORMAN

13TH CENTY

14TH CENTY

MODERN.

- CLOTH FAIR.

N° 9.

NEW NORTH TRANSEPT & PORCH

NORTH AMBULATORY

15TH CENT SCREEN

SITE OF 15TH CENT NAVE

CROSSING

CHOIR

NEW WEST PORCH

SOUTH AMBULATOR

MILDMAY TOMB

NEW SOUTH TRANSEPT

FONT

POPE'S BUILDINGS

REMAINS OF CLOISTERS - NOW A STABLE.

GREEN GRAVE YARD

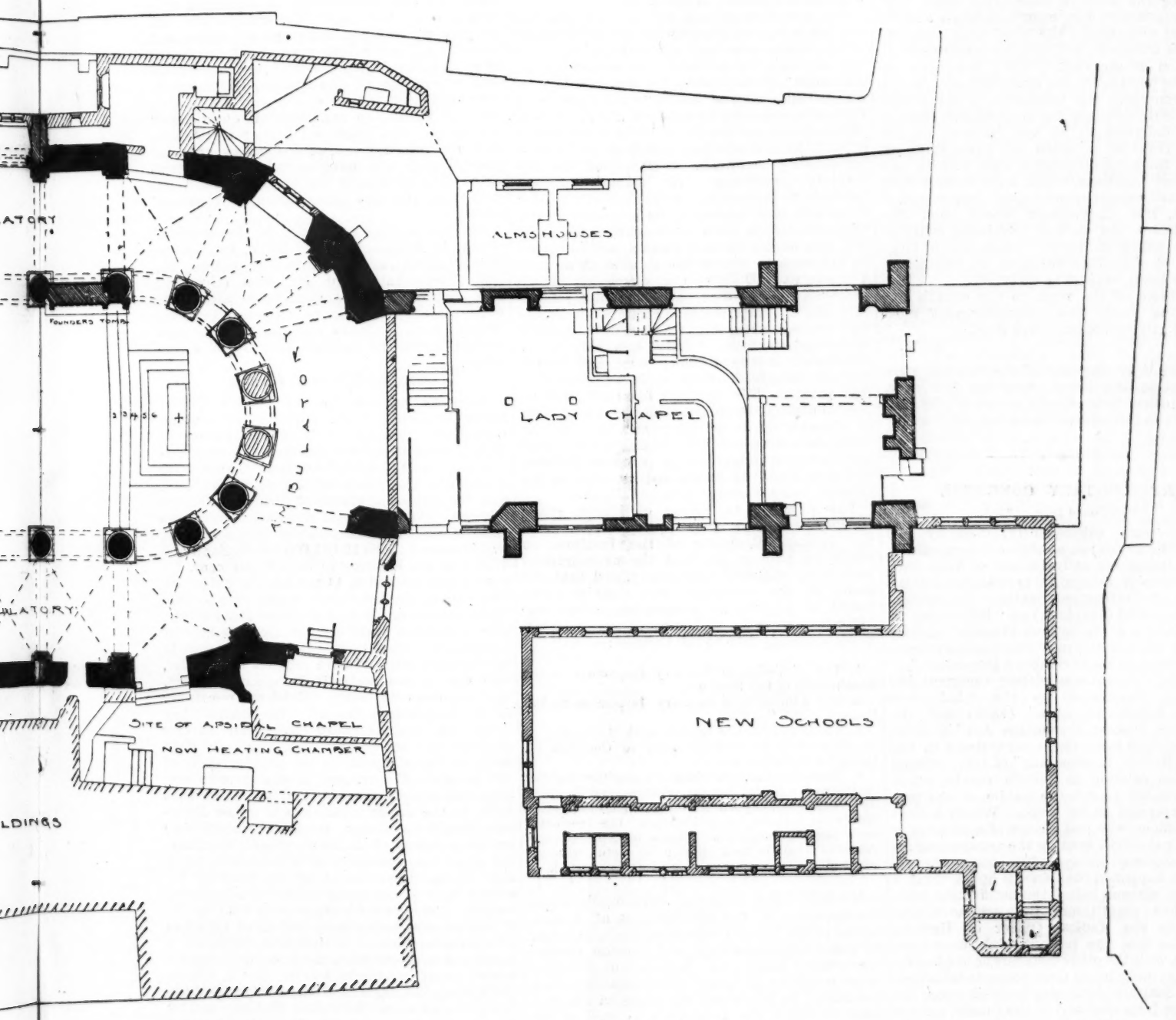
SITE OF S. TRANSEPT.

THOLOMEW THE GREAT W SMITHFIELD LONDON E.C.-

D PLAN AS EXISTING SEPTR. 1892 —

10 20 30 40 50

SCALE OF FEET.



course of erection. The most interesting feature that has been brought to light during the erection of the latter has been the fifteenth-century stone screen across the transept arch, and which formed a screen to the back of the stalls, which, it is known, were carried under the crossing. A similar screen probably existed on the south side, though there is now no trace of it.

A porch is added to the north transept to provide a much-needed entrance to the Church from Cloth Fair, and an entrance is also formed in the south transept. A new porch is also being built to the west entrance, and the rough wall, put up when the nave was destroyed, is being faced with flint and stone.

In the new work the pointed arch has been adopted throughout, in order to differentiate it from the old; but an attempt has been made to preserve the general scale and massiveness of the old work in the new.

Blue Bath stone is used internally, and Portland stone and flints externally.

During the work of restoration since 1883, the fringe-factory has been purchased and the east end completed; the boys' school removed from the triforium, and new schools erected on a portion of the factory site; the forge has also been purchased, and provides a site for the north transept. The remainder of the fringe-factory still conceals the considerable remains of the Lady-chapel, as will be seen on the plan. This is a cause of anxiety, as at present there are no funds to deal with it, and the factory buildings, which have already been condemned, cannot remain much longer, and if removed, the Lady-chapel would soon disappear unless the work of rebuilding could at once be taken in hand. There are a large number of parochial purposes to which the building could be most usefully put.

The whole of the work to the church has been done from the commencement most satisfactorily by Messrs. Dove Bros.

A. W.

*** The three drawings of the transepts were exhibited at the Royal Academy this year. The plan has been kindly prepared by Mr. Aston Webb for publication in the *Builder*.

## THE SANITARY CONGRESS.

(Continued from p. 225.)

Papers were subsequently read by Mr. Parsons (St. Luke's) on a scheme for organising Sanitary Inspectors, or Inspectors of Nuisances, being holders of recognised certificates, into an Institute of Certificated Sanitary Inspectors; by Mr. Fairchild (Clapham) on "Difficulties in the Prevention of Infectious Disease," and by Mr. Wells (Newcastle) on "The Sanitary Institute and its relation to Sanitary Inspectors."

Mr. Fairchild, while admitting the great improvement introduced by the "Infectious Diseases Notification Act" (1889) and the "Infectious Disease Prevention Act" of 1890, which had both been made compulsory in the "Public Health London Act" of 1891, pointed out defects existing in certain details which were calculated to rob the public of the protection intended to be given. Where a busy Medical Officer, who had charge of a case under the Acts, put off till evening the required notification, dangerous delays often occurred. It frequently happened that several hours, if not a day or two, elapsed before the notification from the medical practitioner in attendance was received by the Medical Officer of Health; during this time the patient might have been in contact with the other members of the family without anything being done towards isolation. If every Sanitary Authority insisted upon the notification from the head of the family, a large number of cases of infectious disease would be prevented. The provisions of the Education Acts, too, led school teachers to adopt all kinds of expedients to secure constant attendance from their children without regard to the dangers that might arise. Parents, too, often showed a wicked disregard of the welfare of the community by sending to school at times children they knew to be infected, in order not to lose an attendance medal or other school prize. Instances of reprehensible conduct of the kind, both on the part of teachers and of parents, were adduced. Unwillingness to go to hospital, or to undergo inspection, were other difficulties in the way of the Inspector. It would greatly assist in carrying out disinfection if the medical gentleman attending infectious cases kept at home was compelled to notify the recovery of the patient. In disinfecting it was impossible to be always certain that every infected article is placed in contact with the vapours in use. Many persons believed that disinfection meant destruction, and, consequently, many infected articles were purposely removed. Many of the difficulties in the prevention of infectious disease were simply the result of ignorance and prejudice, and might be remedied in a few years by making Hygiene a compulsory subject in every school throughout the Kingdom.

In the discussion which followed, Messrs. Woonton, St. George's, East, representing the Western District; M. Addiscott, Exeter; Boulton, Burslem; Wilkinson, Derby; Sumner, Wigan; Nicholls, Northampton; Lowry, Wolverhampton; Edwards, St. George's, Southwark; Cowdray, Kidderminster; and Dr. Kealey, Gosport, Vice-President of the Congress, took part, and almost without exception the proposal to make notification of infectious diseases compulsory was approved.

Mr. Wells's paper was replete with practical and important suggestions for the improvement of the educational and professional status of the Sanitary Inspector. He demanded the admission of Inspectors to the privilege of membership of the Sanitary Institute, with right of nomination on the Council. He wanted higher-grade certificates of three categories,—Second Class, First Class, and Honours Class,—the existing certificate to be styled the Elementary Certificate. He called upon the Institute to request each local authority to send at its own cost, annually, its Inspector to the Congress, and to form a committee to draft a Bill, as a model sanitary statute, and to use all its influence to secure the enactment of such a measure. During the discussion which followed, the Secretary of the Sanitary Institute, Mr. E. White Wallis, explained that there was no law or by-law to prevent Inspectors becoming members. They had only to be nominated in the ordinary way, and if the Council thought fit they would be elected in due course. The Sanitary Inspector had no special claim to be admitted either as a member of Council or an ordinary member, for the Institute had no *ex officio* members. Members after one year might be proposed as Fellows, and then could be nominated to seats on the Council, but Associates were not eligible.

The proposal in favour of higher grade certificates was lost after an explanation from Mr. Symons, Registrar of the Institute, in which he pointed out that the examinations were being stiffened continually, and that the grade of the certificate was thereby being raised as rapidly as practicable. The four following proposals of the paper were adopted as recommendations to the Council:—

1. The admission of Sanitary Inspectors to the membership of the Institute.
2. The admission of Sanitary Inspectors to the Council of the Institute.
3. That the Institute request each Authority, at its own cost, to annually send to Congress its Inspector of Nuisances.
4. That the Institute form a committee for the drafting of a Model Sanitary Statute, and do all in its power to accomplish its enactment. Said committee to include, by invitation of the Institute, such local government officers in England and Wales as would in their opinion be useful, whether such officers are members of the Institute or not.

Mr. Bell, Chief Inspector, Portsmouth, urged the necessity of the appointment of a committee to the Local Government Board in favour of some superannuation and pension scheme for Sanitary Inspectors. In the event of failing to get a scheme of direct superannuation from the Board, he advocated the organisation of a fund to which the Inspectors as well as the Board should contribute. A scheme had been suggested by Mr. Boulnois (Liverpool), in which the officers should contribute 3½ per cent. and the Board 1½ per cent., and there was a similar proposal made by the Corporation of Manchester. He concluded by moving:—

That Sanitary Inspectors or Inspectors of Nuisances should be eligible for superannuation, the same as officers under Government or the Poor Law Board; or, that it is highly desirable that a fund should be founded for that purpose, to which both Inspectors and Local Authorities should contribute.

A committee of nine, nominated by the meeting from among those present, was subsequently appointed to consider a superannuation scheme in accordance with the resolution. Mr. Bell afterwards moved:—

That it is desirable that the enlarged powers given to the Metropolis under the Public Health (London) Act, 1891, should also apply to the provinces, and that such powers be given by a new Public Health Act.

The resolution was adopted.

Mr. Wilkinson (Derby) read a paper on "Needed Reform in Sanitary Administration," in which he advocated a high educational status among Sanitary Inspectors, with a proper recognition of the importance of his office and his responsibilities. The appointment of more qualified independent Inspectors, with increased powers and clearly defined duties, would do far more good than any Sanitary Regulations Bill. The paper concluded with the following suggestions:—A complete inspection of every building in accordance with the Acts of 1875 and 1891. An independent Department to deal with nothing but questions of sanitary inspection and construction in connexion with new and old buildings. The compilation and keeping of complete registers of drains and sanitary apparatus, and regulations to prevent any alteration or addition without the sanction and supervision of the Sanitary Department. The establishment of a Government Department of Health to supervise all questions of sanitation, and grant qualifying certificates, and the employment as Inspectors of those persons only who have served an apprenticeship to the work or to the plumbing trade, and passed an Honours examination in plumbers' work.

The proceedings concluded by the voting of thanks to Professor Wynter Blyth, Dr. Kealey, Vice-President, and the Joint Secretaries, Mr. Bell (Portsmouth) and Mr. Beel (Gosport). The members of the Conference afterwards went on an excursion to visit the Pumping Station Sewage Tanks and the Bow Lunatic Asylum, under the conduct of the Hon. Secretaries.

### *Medical Officers of Health.*

After an address by the President, Professor C. Kelly, M.D., papers were read on "Isolation Hospitals," "The Organisation of Village Sanitation," "Water Analysis and Purification," and on "Meat from Tuberculous Animals." The result of the census of 1891 was the principal theme of Professor Kelly's address. The estimated population was more than 700,000 in excess of the actual number, which proved to be 29,001,000 for England and Wales, or an increase of only 11 per cent. for the decade, instead of 14 per cent. as estimated. The excess of births over deaths was in 1890 lower than at any period of the present century. The diminution could only be accounted for by a decrease in the marriage-rate. There were in this country 900,000 more females than males, and the excess was all in urban districts, the numbers in rural districts remaining as at the previous census. He feared they could not look forward to much further decline in the death-rate, for as time went on there would be an accumulation of old people. The returns, he was sorry to say, were not always accurate, and he feared that faith in the happy indications of a low death-rate would be shaken unless they could find out some means of obtaining greater accuracy. He urged the importance of a requisition being sent to the Government by the Sanitary Institute for a quinquennial instead of a decennial census. Papers were subsequently read by Dr. J. Groves, advocating the isolation of all cases of infectious disease in isolation hospitals, a resolution to memorialise the Local Government Board being adopted; by Dr. A. E. Harris (Islington), urging the treatment of phthisis compulsorily as an infectious disease; and by Dr. J. C. Blackman (Portsmouth), advocating the compulsory removal of all persons suffering from infectious disease, irrespective of their social status. A resolution in support of the doctor's views was adopted.

### *Domestic Hygiene.*

The ladies who took part in the Conference met in the Grand Jury Chamber, and were presided over by Mrs. Ernest Day, ex-Mayoress of Worcester, who took the place of Lady Douglas Galton, the President, who was unavoidably prevented from being present. Sir Charles Cameron, President of the Institute, briefly opened the proceedings, explaining that this was the first occasion on which a branch of the Conference had been held specially for

women, who, however, he thought would form a most important auxiliary to the Institute. Mrs. Day then delivered a brief inaugural address on "Our Opportunities of Spreading a Knowledge of Hygiene to Women and Girls." She referred to the value of hygienic knowledge to women, and showed how the untrained might obtain that knowledge. When they possessed it, there was a natural desire to spread the knowledge to those less instructed. She enumerated several organisations that already existed, and which might be adapted for instruction in hygiene, or in God's laws, physical and spiritual. Miss Ethel Lamport, lecturer on Hygiene and Sick Nursing to the Ladies' Sanitary Association, spoke on "Food with Special Relation to the Sick." Miss Barnett opened the discussion. Dr. Williams-Freeman spoke on the chief hygienic causes of mortality among young children, and Miss Charlotte A. Smith urged the importance of physical training for both boys and girls.

*English Homes.*

Sir Thomas Crawford, Chairman of the Council of the Institute, delivered a lecture in the evening to a large audience at the Town-hall, of which the following is a summary:—

The love of home was proverbial with Englishmen, who were proud of their ancestors and of their traditions. "Sprung from such men, and inheriting such traditions," said Sir Thomas, "our homes ought to be considerably in advance of other nations. Are they so? In the imposing mansion in which I write, occupying a conspicuous position in one of the most fashionable watering-places in England, a stagnant atmosphere is but too perceptible in the corridors, while a vigorous use of open windows barely suffices to make the public rooms habitable. The picture of our English homes sketched by the Countess de Visca in a paper read at the Congress at Leicester, and published in the 'Transactions for 1885-6,' shows ample evidence of the pressing need that exists for further improvement in almost every detail of domestic sanitation. With regard to externals, the house itself must stand on a healthy site. This consideration is no doubt present to the mind of anyone seeking a mansion or a house of even much less pretensions, but it is too often altogether overlooked by the cottager; and anyone who takes note of the present system of disposing of so-called rubbish in and about great cities, and the rapidity with which ground made out of what was but yesterday a mere swamp, is covered by cottages, too often constructed without these safeguards devised to protect the inmates from damp and ground air, must see the danger which lurks beneath. There is another aspect in which this subject must be viewed. Sunlight is a most important and essential element in regard to the salubrity, as well as the suitableness, of a house for residential purposes. No apartment is really fit for human habitation which is not freely traversed by sunlight. If by the direct rays of the sun, so much the better. Those of you who have studied the influence of light on the development of colour in the vegetable, and indeed in the animal world also, need not be told that healthy growth is not attainable without a reasonable supply of that vivifying influence." A good water-supply was an obvious necessity for every dwelling. "Thanks to the liberality," he continued, "of some among us, drinking fountains for man and beast are to be seen in yearly-increasing numbers along our great thoroughfares, and in places where the people are apt to congregate; but this is not enough; every street and alley, as well as every inhabited house, should have a continuous water-supply as one of the necessary requisites to be provided by the owner, and his power to recover rent should be made conditional on the efficiency and sufficiency of this supply. Add to this an efficient water conservancy, with powers adequate to prevent the pollution of our rivers, and to enforce an effective scavenging, and suitable disposal of all sewage and other filth now permitted to drain in our watercourses, or foul our village wells, and there need be no fear of a water famine in this country, even with a further great increase of population." The interiors of our houses, their ventilation, the prevention of draughts, the proportion between walls and windows, and the cubic space necessary per person, were criticised, and the lecture concluded with reference to the housing of the masses. "The housing of the middle and lower classes in large towns has been in the past, and still is, largely in the hands of speculative builders, who hope for a profitable return on capital so invested. Of such buildings it may be said, without attributing any improper motive to the builder, that cheapness of material, economy in their use, and on the class and quality of the labour expended on their construction, are ever-present elements in the builder's estimate of cost. It is, presumably, to such considerations that leaking roofs, walls pervious alike to air and moisture, ill-fitting doors and windows, and badly-jointed floors, are not uncommon defects in town houses rented at sums ranging from 100*l.* to 20*l.* annually. These defects must be remedied by the tenant as best he can, hence his resort to carpeting, curtains, wall-papers, &c." In a final passage this overcrowding was again referred to. "The housing of the working classes is in a fair way of being satisfactorily provided for, but nothing has yet been done to provide suitable accommodation for the poorest class of the people not actually paupers. Many of them are infinitely worse off than the regular inmates of the workhouse; but some element of self-respect, or pride it may be, constrains them to endure hardship and privation, even to the verge of starvation, rather than take that last, and to them irretrievable, step of going to the workhouse. There is much need for active interference in favour of this class, and the best method of aiding them appears to be also the cheapest. House them in homes in which they will be provided with those prime necessaries, pure air, good water, light, and shelter at rates which they can pay, while leaving a sufficient margin for food and clothing. The loafer should not be tolerated under any circumstances,—his gregarious and filthy habits, and his hopeless laziness and moral degradation, render his consignment to the workhouse a necessity. I do not include under this head the casual wanderer out of employ, for whom other arrangements should be made; or the blind and otherwise maimed, who make a profitable display of their misfortunes. All such should, of course, be compulsorily assigned to asylums supported by the State. After all that can be done has been realised, benevolence will still have a wide field for its exercise." *

## *COMPETITIONS.*

PROPOSED TOWN HALL, WALSALL.—We are informed by the Town Clerk that the Corporation have decided to appoint a professional assessor to adjudicate upon the plans for the new Town Hall, Walsall, when received, but the selection of the assessor has not yet been made. He will, it is added, undoubtedly be a gentleman of standing in the profession. We gave particulars in the *Builder* for August 6, page 112, of the preliminary competition, which was for the purpose of ascertaining the maximum accommodation which could be obtained on the site.

TECHNICAL SCHOOLS, ACCRINGTON.—In an open competition for new technical schools at Accrington, the designs of Messrs. Morley & Woodhouse, architects, of Bradford, have been awarded the first premium.

FOUR BOARD SCHOOLS, MANCHESTER.—A special meeting of the Manchester School Board was held on the 9th inst., for the purpose of selecting architects for the four schools which it is proposed to erect shortly. The clerk read the minutes of the General Purposes Committee, which recommended that the following appointments be made:—Messrs. Royle & Bennett as architects of the Cheetham Hill Higher Grade School, Messrs. Maxwell & Tuke of the Devonshire-street Higher Grade School, Mr. H. E Stelfox of the Ashton Old-road School, and Messrs. Preston & Vaughan of the Burgess-street Infants' School. The total estimated cost of the new schools is £32,000. The Chairman (Mr. E. J. Broadfield) moved, and the Rev. J. Watson seconded, the reception and confirmation of the minutes. After some discussion the motion was agreed to.

THEATRES BURNED DOWN.—The City Theatre, Cordova, has been totally destroyed by fire, and a similar fate has overtaken the Teatro Sociale in Biella, Sardinia. The latter had cost 300,000 lire.

ELECTRIC LIGHTING.—We are informed that Andrews's concentric wiring is being adopted in the electric lighting of five of the chapels and dining-halls of the colleges at Cambridge, in order to avoid the disfigurement of the interior that would result by using wood casing.

* We shall continue our report next week.

## Books.

*Les Artistes Célèbres. Corot.* Par L. ROGER-MILÈS. Paris: Librairie de l'Art.

THIS is one of the series of thin octavo volumes on eminent artists issued from the *Librairie de l'Art* in the Cité d'Antin, others of which have been noticed from time to time in our columns.

The success of Corot was so late, the first fame of his works in this country especially hardly counting twenty-five years back, that it will surprise many who were not previously acquainted with the facts of his life to learn that he was born as early as 1795. He was, in fact, almost an old man before his reputation was gained even in his own country. His mother was "Madame Corot, Marchande des Modes," whose shop was at the corner of the Rue du Bac and the Pont Royal, and Corot himself was apprenticed to a draper, and pronounced by his master to be of no good in that line of business. His parents were well off, and gave way to his wishes in allowing him to indulge that "useless pastime" of painting, with an annual allowance of 1,500 livres to live upon, and Corot sat down to paint his first picture on the banks of the river a little above the Pont Royal. On the whole it may be said that he was not badly treated by his parents, considering that they knew nothing of art and could not in the least understand his devotion to it.

M. Roger-Milès quotes some critiques on landscape painting written at the time when Corot commenced his work, illustrating the prevalent feeling about landscape at that time, and its dry scholastic division into "paysage historique" and "paysage champêtre." Corot had something different to show, but his artistic companions for a long time did not take him *au sérieux* as a painter. They liked him and his simplicity, and his good humour, and his songs, which he sang in a clear tenor voice, but did not make much account of his art; and in 1835 a critic said of his work in the Salon "Sa touche est lourde et mate; la souplesse, l'humidité, la charme de la nature lui sont étrangers." Alfred de Musset wrote briefly in 1836 "Corot, dans la *Campagne de Rome*, a de grands admirateurs." It was not until well on in the forties, however, that he became at all widely accepted, even among competent critics, as a painter of a high order. A critique by M. Lagenevais, written in 1849, is one of the first which attempts to gauge the nature of Corot's genius and to recognise him as an original painter; and he says that the prominent quality which strikes one in Corot's works is "l'absence de facture," the employment of always the most simple and direct means to produce his effects. We should hardly agree with this. To our thinking Corot had a very special and individual *facture*, the prominent quality in which was the art of conveying the impression of detail without really giving any of the detail; representing the effect of thin sprays half-clad with leaves, while escaping altogether from any precise or hard lines in the indication of the foliage. Another point in Corot's art on which his biographer touches with true critical insight was his treatment of figures in landscape. He was not content to put in a figure or two to scale a landscape, neither was he one of those painters who would render the figure the prominent interest of the picture, and add a landscape background to it. His aim was to render his figures so completely a part both of the composition and the sentiment of the landscape, that the one element seemed inseparable from the other; the figures were a part of the very sentiment of the scene. It was not necessary with this object to finish the figures highly; they would have started out, in that case, too brusquely from the ideal plane of the composition; he treated them as he treated his trees, suggesting detail in a broad fashion, but allowing nothing to become too hard or precise. In some of his principal works he has achieved this poetic blending of figure and landscape so perfectly and with such power of suggestion that he may almost be said to have created in this class of work a new phase of ideal painting. In regard to one of his finest works of this class, "Orpheus and Eurydice," it is interesting to note that this was inspired by his great admiration for Madame Viardot-Garcia's performance of the part of Orpheus in Gluck's

opera. A less imaginative artist would have painted a picture of the scene with a portrait figure of the singer; Corot made a new creation out of it.

The traits of the artist's character given in this account of him show him to have been one of the most lovable, as by those who knew him he was evidently one of the most beloved of men. It is to be regretted that the book gives us no fac-similes of the artist's own sketches, such as we have had in other volumes of the series. The illustrations, however, are exceedingly well executed, and in their pen-sketches from the master's works MM. Alfred Robaut, Yon, and Daliphard have dealt ably with the difficult task of preserving in this medium the feeling and sentiment of the original works.

---

*Transactions of the Seventh International Congress of Hygiene and Demography.* Volume VI. Section VI.: "Architecture in Relation to Hygiene." London: Eyre & Spottiswoode.

THIS volume of the Transactions of the Congress of Hygiene contains the papers, and some brief report of the discussions, in the Architectural section of the Congress. Most of the papers were reported at more or less length in our columns at the time, and several of them in full. Many of the ideas embodied in these papers, and some of the suggestions thrown out in discussion, are worthy of more serious and detailed consideration than could be given to them at the moment. In the discussion on the first paper, a rather vague one on Open Spaces, we notice Mr. Rogers Field's important suggestion that every opportunity should be seized, before new building schemes could intervene, for securing planted boulevards between open spaces. He mentioned among one of the chances lost, that of making a splendid boulevard between Regent's Park and Hampstead Heath, an idea suggested forty years ago, but neglected then. Other similar chances may be lost now or in the course of a few years, which if made the best of would be a boon to generations to come. Herr Stübben's paper on "The Hygienic Principles of the Extension and Internal Arrangements of Cities" presents a great deal of practical advice and experience in a concentrated form, though the principles of treatment recommended are on a very large scale, and such as can only be very gradually and perhaps only partially realised in towns in which old buildings and streets are mingled with new. Following upon this, Mr. Blashill's short and practical paper on the "Control of the Construction of Dwelling Houses" carries out the further consideration of the subject more in detail, and in the course of the discussion on it Dr. Sykes urged the importance not only of providing for the proper construction of dwelling houses built as such, but of providing against the occupation as dwelling-houses of buildings not erected with that object and consequently not fitted for such occupation. There is of course sufficient legal power to deal with such cases; the point is that they are or may be overlooked. M. Trélat's paper dealt with the same class of subject from another point of view, and also suggested some points often overlooked, especially the influence of window area in lowering internal temperature, and the influence which extent of window area ought to have on the thickness and construction of walls. The papers by Mr. Lennox Browne and Mr. Ernest Turner on the Sanitation of Theatres, form a very valuable *résumé* of the subject, and were reported and illustrated in our columns by reproductions of most of the plans exhibited, which reproductions, we are glad to see, are incorporated in the pages of the Transactions. In the course of the discussion a French visitor, M. F. Bouhon (an architect and member of the Paris Commission on unhealthy dwellings) expressed the surprise with which he and other French visitors to London noticed so many cellar dwellings in various classes of buildings, and mentioned that after the fire at the Opéra Comique a stringent law was passed one of the provisions of which was that no part of the auditorium should be below ground. We note this on account of its remarkable contrast between the practice now being established in England of sinking a large part of the auditorium below the ground level, in those which are considered the best and most sanitary theatres of recent construction. The questions of "Common Lodging Houses," and that of "Cottage Homes for the Industrial Classes" are treated respectively by Mr. Gordon Smith and Mr. Rowland Plumbe; and that of "Block Dwellings for the Industrial Classes" by Dr. Sykes, to whose paper we may call special attention at a time when this class of block dwelling is being so largely erected. Dr. Sykes's calculations and diagrams as to the extent of cubic space which may be occupied by buildings in relation to the area on which they stand ought to have serious attention, as it is a common fallacy, in practice if not in theory, to place lofty blocks of this kind far too close together on the area, forgetting that in proportion as we increase the height of the buildings and the number of inhabitants in a vertical direction, in nearly the same proportion must we space out and isolate the buildings in a horizontal direction. The papers on hospitals by Dr. Thorne Thorne and Mr. Keith Young are valuable summaries of this subject under certain of its aspects.

It is to be hoped that this small volume, which contains such an amount of practical suggestion on the sanitary conditions of building, will receive attention both from architects and the general public; it is a small and inexpensive volume, and well worth procuring by all who are interested in the subjects treated of.

---

*Garden Design and Architects' Gardens:* Two Reviews, illustrated, to show by actual examples from British gardens, that clipping and aligning trees to make them "harmonise" with architecture is barbarous, needless, and inartistic. By W. ROBINSON, F.L.S. London: John Murray. 1892.

THIS is a landscape-gardener's revolt against the modern teaching of the architects, and especially against the two books by Mr. Blomfield and the late J. D. Sedding, for which Mr. Robinson has no sufficient expressions, apparently, of anger and contempt. He has, in fact, rather overdone his indignation, leaving on the reader's mind the impression of a manifest conviction that "this our craft is in danger to be set at naught;" and though the illustrations are many of them very pretty pictures, we do not think that they prove much to the author's purpose, while the literary style of the book is not calculated to raise the reader's opinion as to the intellectual culture of landscape-gardener *versus* architect.

The claim of the architect to be the directing mind Mr. Robinson evidently does not understand. He thinks that because gardeners understand the horticultural treatment of vegetation they are to claim to understand the art of gardening design also. The two things are perfectly distinct, but we do not expect Mr. Robinson to understand that. He is violent in his assertions that there is an art in landscape-gardening, but does not seem able to define what it is.

To some of Mr. Robinson's sarcasms about "vegetable sculpture" the two architect writers laid themselves open, and we have no defence for and no sympathy with the clipping of trees or hedges into imitative shapes: the simple clipping them into formal shapes may be good or bad according to circumstances, according to the style of the house and the closeness of the relation between the house and the garden. But there can be no question at all that the system of laying out grounds in relation to the architectural style of the house is a matter within the architect's province; that the house and garden ought to be considered as a whole, and that the landscape-gardener as a rule entirely neglects this, while his so-called artistic laying-out of a garden is merely a trick of imitating natural effects, which is not worth doing, and which, if it were, any one can do. In fact, there is no art of landscape-gardening at all, and the pretence of it is an imposture which the world is getting impatient of.

If people want an informal garden they do not require a professional person to lay it out for them. All they will get by that is the introduction of various kinds of sham picturesque; artificially winding walks and artificially introduced clumps of trees, pretending to be natural. The trees are beautiful no doubt, but the landscape-gardener did not make their beauty; and they would be as beautiful without the house as with it; they have no relation to it. The house is a creation of art, on the other hand, and its effect is greatly enhanced by connecting it with a formal treatment of the ground, which seems to extend and glorify the architectural treatment of the house. And to do that is certainly an architect's work; no landscape-gardener understands it, for the simple reason that no landscape-gardener understands architecture, as far as we ever knew. They have at all events taken much trouble in their books to prove that they did not understand it.

The general literary style of the book is so much worse than commonplace, that we can only express surprise that it should ever have been issued from the house of the first publisher in London. It is not a credit to the traditions of "Murray."

---

*Hints on Chip-carving, Class Teaching, and other Northern Styles.* By ELEANOR ROWE. London: Sutton, Drowley, & Co.

"CHIP-CARVING," as we understand it from Miss Rowe's pages, means a simple style of surface ornament produced by cutting out chips of wood from a plane surface, leaving a pattern formed by the indentations between the untouched surfaces, as in a wood engraving, which is a more elaborate application of the same kind of process. It differs from carving proper in that there is no modelling of surfaces in relief, and is the principle on which many elaborate designs in wood are produced in Norwegian work. It may therefore be regarded as a more simple style of carving, within the reach of many who may not have time or talent to go into the more elaborate forms of art workmanship in wood.

Miss Rowe goes into the process in a very thorough manner, prefacing the remarks on actual work by a chapter on geometrical drawing, intended to prepare the student for setting out the kind of geometrically arranged patterns which are most suitable for this class of work. The method of work is illustrated by small and simple designs showing various ways in which surfaces can be cut so as to produce form and contrast of light and shade; and there follow some examples of more elaborate designs produced by the definition of scroll-patterns by sinkings in the wood. We are glad to be able to add that these designs are of very good quality, and calculated to form the taste of the student as well as to improve his mechanical capacity in the wotk. The work is a very useful one for its purpose.

---

*A Manual of Practical Instruction in the Art of Brass Repoussé: for Amateurs.* By GAWTHORP (Artificer in Brass and Iron). London: Sutton Drowley & Co. 1892.

THE directions for practical working of brass repoussé seem to be clearly and intelligently given, with sufficient illustrations for practical purposes. There are no "designs" given, which in small books of this kind on art-workmanship are generally the weak point, and thus "Gawthorp" (who seems to despise the use of initials) has escaped one pitfall. We can recommend his small book to amateurs who wish to try their hands at brass repoussé, as a useful manual on the subject, though the concluding sentence, that advice, hints, and assistance "can always be obtained at Gawthorp's metal works, Long-acre," savours a little too much of an advertisement.

---

LECTURES AT THE SANITARY INSTITUTE.—The following lectures and demonstrations for sanitary officers, at the Parkes Museum, are arranged for Tuesdays and Fridays at eight p.m.:—October 4, "Ventilation, Warming, and Lighting," by Sir Douglas Galton. October 7, "Principles of Calculating Areas, Cubic Space, &c.," by Mr. H. Law. October 11, "Water Supply, Drinking Water, Pollution of Water," by Dr. Louis Parkes. October 14, "House Drainage," by Mr. W. C. Tyndale. October 18, "Sewage Disposal," by Professor H. Robinson. October 21, "Sanitary Building Construction," by Mr. H. H. Collins. October 25, "Sanitary Appliances," by Professor Corfield. October 28, "Details of Plumbers' Work," by Mr. J. Wright Clarke. November 1, "Scavenging, Disposal of Refuse," by Mr. T. De Courcy Meade. November 4, "Diseases of Animals in relation to Meat Supply; Characteristics of Vegetables, Fish, &c., unfit for food," by Prof. A. Wynter Blyth. November 8, "Infectious Diseases and Methods of Disinfection," by Mr. Shirley F. Murphy. November 11, "General Powers and Duties of Inspectors of Nuisances," by Mr. J. F. J. Sykes. November 15, "Objects and Methods of Inspection," by the same. November 18, "Nature of Nuisances, including Nuisances the abatement of which is difficult," by the same. November 22, "Trade Nuisances," by Prof. A. Bostock Hill. November 25, "Sanitary Law: English, Scotch, and Irish; General Enactments; Public Health Act, 1875; Model By-laws, &c.," by Prof. A. Wynter Blyth. November 29, "Sanitary Laws and Regulations Governing the Metropolis," by the same.

## Correspondence.

*To the Editor of* THE BUILDER.

### ARTISTIC COPYRIGHT.

SIR,—There is a certain obscurity in the law of copyright concerning the preliminary sketches made by an artist or an architect, before commencing the actual drawing which is approved of. In the case of Barry and the Houses of Parliament it would appear to have been ruled that they all belong to the employer. Now many preliminary sketches frequently contain ideas not carried out or shown in the ultimate design, and the ruling is absurd. Still it is law as many lawyers read it. The safest way, therefore, for every architect or artist—and all should know it—is to write on all preliminary sketches, "Copyright retained by" so and so. The question should be settled, and some of your readers may have a better method in view.

N. H. J. WESTLAKE.

P.S.—It is time that some agitation were set on foot to make the ruling more definite.

### THE INSTITUTE AND ARCHITECTURE.

SIR,—It seems to be assumed that it is not possible to test by examination the qualifications of candidates for the fellowship of the Royal Institute of British Architects.

I can quite understand that many an architect in the "fifties" might be too "rusty" for an examination in history and in theory, which to one in the twenties would not be difficult.

But surely a man is never too old to undergo an examination in his powers of design. I am myself a "person of riper years," but should have no objection to prove myself capable of designing (in strict seclusion) something which would justify my architectural standing.

If the would-be Fellow could do this, and also point to a respectable list of executed works, he ought to be admitted.

Then, to give zest to the work, let it be understood that, if the candidate desire it, his design, produced in solitude, might, with his consent, be preserved among the archives of the Institute as his "diploma" work.

My suggestion may raise a smile, but is it so very impracticable? And would it not exclude the absolute "duffer"? I am afraid that a great many of the existing Fellows would have to be classed under this heading if put on my proposed gridiron. We all know some rather severe examples, men who have done their work by "ghostly" aids all their lives. A few hours alone with a tee-square and drawing-board would expose them. But I do not ask for this. I only desire that there may be no more of them. COMMON SENSE.

September 11, 1892.

*** Our correspondent rather misses the point of the question, which is, What is to be the standard for examination in design? We published the other day a very clever and original elevation of a new building, in which large Classic attached columns were introduced immediately under the main cornice, the conventional architrave and frieze being omitted. We see no objection to the treatment, but it is quite possible that a conservative majority in an examining committee might have refused to pass that, on the ground that the author did not understand the use and meaning of the Classic order! The diploma work of a Royal Academician is not a parallel case with that proposed by our correspondent, as it is not the test of his claim to election, it is a work deposited *after* election, and is generally an inadequate specimen of its author's powers, as few artists care to give away one of their best productions in compliance with a merely formal regulation.—ED.

## The Student's Column.

### CONCRETE.—XII.

#### ARTIFICIAL CEMENTS (*continued*).

#### PORTLAND: EXPANSION.

MR. GRANT in his paper in 1880 gave the inferences, which he had drawn from the experiments of Messrs. Dyckerhoff and others. They were:—"1. That all cements expand more or less when hardening in water. 2. That the expansion of good cement is so very slight that in practice it need hardly be taken into consideration. 3. That it is greatest when the increase of strength is most active. 4. That it diminishes in proportion to the addition of sand. 5. That it is greatest with new cement, and least with that which has been kept in stock. 6. That it is increased by the addition of gypsum. 7. Further experiments prove that it is greatest with over-limed or lightly-burnt cements, and that all cements contract when drying, and expand on being put into water." The experiments to which Mr. Grant referred, were made by Messrs. Dyckerhoff on twelve varieties of cements at the ages of one, four, thirteen, twenty-six, thirty-nine, and fifty-two weeks; prisms 10 centimètres long (= 3·97 in.) and 5 centimètres square were placed in water, and their expansion was noted in millimètres. The following table has been compiled from these experiments, the amount of expansion being here given in general terms per unit of length:—

TABLE XVI.

*Expansion of Portland Cement during Hardening.*

| No. | Time of Setting, in Minutes | Neat Cement. | | | 1 Cement and 3 Standard Sand. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | | 1 week. | 1 month. | 1 year. | 1 week. | 1 month. | 1 year. | |
| 1 | 20 | ·00069 | ·00113 | ·00213 | ·00016 | ·00026 | ·00043 | |
| 2 | 210 | ·00032 | ·00062 | ·00127 | ·00012 | ·00019 | ·00035 | Cement two months older than No. 1. |
| 3 | 360 | ·00090 | ·00158 | ·00258 | — | — | — | With 1 p.c. gypsum. |
| 4 | 600 | ·00097 | ·00159 | ·00248 | ·00027 | ·00042 | ·00050 | ,, 2 ,, ,, |
| 5 | 800 | ·00413 | ·00447 | ·01803 | ·00140 | ·00443 | ·00471 | ,, 5 ,, ,, |

The same cement was used throughout the tests here given; it left 9·8 per cent. residue on a sieve with 5,806 meshes to the square inch. It will be seen, therefore, that the expansion in water of a bar of No. 2 cement and sand, 1,000 in. long (83·3 ft.), would be only ·35 of an inch at the end of a year; an expansion so little as to be practically incalculable.

The expansion and contraction, due to changes of temperature, are not considered in these experiments; the variation due to temperature is of great importance, and is greater than the variation caused by mere hardening. Cement and concrete, however, are no greater offenders in this respect than iron and brick and stone. A bar of iron 10 ft. long, if raised to a temperature of 2,000 deg. Fahr., will expand about 1·6 in.; while a column of brickwork 10 ft. high would expand about ·6 in. under the same conditions.

*Specifications.*—The variety of specifications for Portland cement is somewhat bewildering. We have already mentioned Mr. Gostling's list of twenty-one specifications, almost all different, but Portland cement is now better understood, and specifications ought not to differ to the extent they did a dozen years ago. It is not possible, of course, to formulate a specification which shall be suitable for all circumstances; for instance, in the great majority of cases, a slow-setting cement will be most useful, but there are cases where a quick-setting cement is quite necessary, such as foundations in running water, underpinning, &c. Some important characteristics of cement,—namely, its fineness and soundness, need not vary, and the tensile strength need vary only for those works where quick-setting cement is required. Briquettes of quick-setting cement may be specified to give lower results than those made from slow-setting.

The German standard regulations, among other things, require that the cement shall be thoroughly sound,—that a thin pat of neat cement which, after setting on glass, is placed in water, shall not crack at the edges,—that not more than 10 per cent. of it shall remain on a sieve with 5,806 meshes to the square inch (the thickness of the wire being equal to half the width of the meshes), and that cements requiring more than half an hour to set, made into briquettes with three parts by weight of standard sand, and tested after being one day in air and twenty-seven days in water, shall have a tensile strength of 227·5 lbs. per square inch, and a compressive strength of 2,275 lbs. per square inch.

Mr. Grant in 1880 communicated to the Institution of Civil Engineers a specification based on the German standard regulations then in force. The chief requirements of this specification may be summarised thus:—*Fineness*, not more than [20 or 10] per cent. residue on a sieve of [6,400 or 5,806] meshes to the square inch; *tensile strength* at twenty-eight days of cement gauged with three times its weight of dry sand, which has passed a sieve of 400 and been retained upon one of 900 meshes to the square inch, to be [142 or higher number] lbs. per square inch for cement which sets when neat in less than two hours, and [170] lbs. per square inch for cement which takes from two to five hours to set neat. If the weight and tensile strength of the neat cement be specified, Mr. Grant would insert the following clauses:—*Weight*, not less than 112 lbs. to the bushel; *tensile strength* of neat cement, at least 400 lbs. per square inch at the end of seven days, and 550 or 600 lbs. after twenty-eight days, the briquettes being one day in air, and the rest in water. Mr. Grant also required the contractor to store the cement in bulk in a suitable room until tests had been made.

Mr. V. de Michele considered that a simpler specification could be framed, which would answer the purpose quite as well as the one proposed by Mr. Grant. He suggested:—"1. The Portland cement, before being used, to stand 300 lbs. tensile strain per square inch seven days after gauging; the average of not less than three breakings being taken. 2. The cement to be finely ground, leaving a residue not exceeding 10 per cent. after passing a sieve of 2,500 holes per square inch. 3. Pat samples ½ in. thick, made at frequent intervals, and immersed in water within one hour, to show no cracks from expansion within forty-eight hours after gauging." "He would discard the weight per bushel test, as being useless and misleading." Mr. Michele has recently suggested another specification, which will be found in the *Builder* for April 2, 1892. We reprint it here, with a few verbal alterations, so that it can be more easily compared with his specification of 1880:—"1. *Tensile strength*, 400 lb. per square inch at seven days; the test bricks to be gauged by a skilled man, with any quantity of water, in any way he likes; the average of three to be taken, which shall represent about 100 tons or less; the strain to be applied as quickly as possible. 2. *Fineness*, 10 per cent. residue on a 50 sieve (2,500 meshes to the square inch) made of wire one-hundredth of an inch in diameter; shaking to be continued until no more of the cement passes through the sieve. 3. *Soundness*, pats one-eighth of an inch thick, gauged on glass, immersed in water, and left there for the whole period, must be absolutely sound at seven days; one pat to be made for each three bricks."

It will be noticed that the second specification demands one-third more strength than the first, and requires pats to be ⅛ in. thick instead of ½ in., to be immersed immediately, and to remain in water seven days instead of two; the latter specification is undoubtedly better than the earlier one, and should ensure a very good Portland cement. Some manufacturers issue specifications of their cement, but as a rule the tests are not as stringent as would be required by many engineers. As good specimens of manufacturers' specifications we give the two put forth by Messrs. Charles Nelson & Co., Limited, of Stockton, Rugby.

SPECIFICATION No. 1.

*Weight.*—The cement to weigh not less than 118 lbs. per striked bushel.

*Fineness.*—To be ground so that not more than 5 per cent. residue shall be left on a sieve having 2,500 meshes to the square inch.

*Tensile Strain.*—The briquettes at seven days (during six of which they shall be immersed in water) shall not break at less than 450 lbs. on the square inch.

SPECIFICATION No. 2.

*Weight.*—The cement to weigh not less than 110 lbs. per square inch.

*Fineness.*—To be ground so that not more than 10 per cent. residue shall be left on a sieve having 2,500 meshes to the square inch.

*Tensile Strain.*—The briquettes at seven days (during six of which they shall be immersed in water) shall not break at less than 350 lbs. on the square inch.

It will be noticed that these specifications contain no test for soundness, and that the fineness is not up to the standard which many engineers now require. The fineness and tensile strength required by the first specification are, however, as high as need be demanded;

they are both better than those of Mr. Michele's specifications. If a cement be as finely-ground and as strong as Messrs. Nelson & Co.'s specification No. 1, and prove quite satisfactory when subjected to Mr. Michele's, or preferably, Mr. Faija's (see Chapter XI.) test for soundness, it will be good enough for all purposes. We may just add that Mr. Mann has suggested a specification for adhesive strength and fineness, but it has not come into general use.

*Storing.*—A clause is frequently inserted in specifications to the effect that the cement must be stored in bulk for a certain length of time in a suitable room. Some cements naturally require longer time for "purging" or air-slaking than others, as they contain more quick-lime; and some cements are purged to a considerable extent by the manufacturers before they are put into bags or barrels, and consequently may require little or no purging after their arrival at the works.

As we have already explained, Portland cement ought not to be used quite fresh, but opinions differ as to the length of time which it ought to be kept before being used. An extremely fine cement theoretically requires no exposure at all. A good cement should be sufficiently air-slaked by an exposure of two or three weeks. It is not enough to keep the cement in bags or barrels for that length of time, but it must be emptied upon a wooden or damp-proof concrete floor in a dry building, to a depth of 2 ft. or 3 ft., and allowed to remain there for the specified time. Even cement, which has been kept in bags for months, ought to be stored in bulk before being used. Great care must be exercised that the cement is not stored in a damp place, such as a cellar, or on a floor of flags or other material, between the joints of which or through which moisture can easily rise. Cement, which has been carefully packed in paper-lined barrels, and exported to a warm and moist country, has become lumpy after being kept for a year in the barrels, and the concrete made from it has proved a failure. There is a limit beyond which cement ought not to be kept, but it is impossible to lay down any hard-and-fast rule, as the limit will vary according to the nature of the cement and the manner of storage. The coarser the cement the longer the exposure which is required.

The effects of properly storing and air-slaking Portland cement are the retardation of the time of setting, increase of strength, the lessening or the total loss of any tendency to "blow," and the increase of bulk and consequent decrease of weight per bushel.

Where a test for soundness is specified, there is not so much necessity for specifying that the cement shall be stored in bulk for a certain time; because, if the cement be unsound when fresh, it of course falls short of the specification, and can, therefore, be rejected. The contractor will in this case be only too glad to render it sound if that can be done by storing it in bulk for a few weeks.

Where, however, no test for soundness is specified, the proper storage of the cement in bulk (not in bags or barrels) for some weeks, must be required. The contractor may try to evade this demand, but it must be insisted on, even when the cement has been obtained from a manufacturer of good reputation, whose name may have been mentioned in the specification. Otherwise, it will not be safe to use the cement.

## *GENERAL BUILDING NEWS.*

CHURCH SCHOOLS, WILMSLOW, LANCASHIRE.—New Church Schools were opened at Wilmslow on the 13th inst. The new buildings have been erected in a populous part of the district, and have cost close upon 2,000*l.* Mr. Lord, of Manchester, was the architect, and Mr. J. K. Coates, of Wilmslow, the contractor. All the rooms of the schools are fitted with noiseless block flooring.

PROPOSED PAROCHIAL OFFICES, AIRDRIE, LANARKSHIRE.—On the 5th inst. the Airdrie Dean of Guild Court passed the plans for the erection of a suite of offices and Board-room for the New Monkland Parochial Board on a site contiguous to the Free High Church in North Bridge-street. The premises are to consist of the inspector's offices and offices for the collector of rates, as also a Board-room and other apartments in the upper story. The plans have been prepared by Mr. George Arthur, architect, Airdrie, and the estimated cost will be about 1,200*l.*

NEW FREE CHURCH, COWDENBEATH, FIFE.—A new Free church was opened at Cowdenbeath on the 25th ult. The area of the church is seated for 440, while the end gallery will accommodate 150. In connexion with and behind the church there is to be a hall capable of seating upwards of 200 people. Vestry, lavatory, &c., have been provided. The front elevation is executed in dressed freestone, and the side and back walls in pressed brick. The seating is varnished yellow-pine, and the ceiling is finished in plaster with moulded ribs and cornice mouldings. The cost will be about 2,200*l.* Mr. Andrew Scobie, Dunfermline, is the architect for the buildings.

WESLEYAN CHAPEL, FILLONGLEY, WARWICKSHIRE.—The memorial-stone of a new Wesleyan Chapel was laid at Fillongley, Warwickshire, on the 7th inst. The new buildings will include a chapel, school, and a caretaker's house. They will be of the Gothic style and built of red brick with stone dressings. On the left-hand angle of the chapel, which will accommodate 125 persons, will be a tower and spire 60 ft. high. On the same side will be the school, which will accommodate seventy-five persons. If needed for a large service the school and chapel can be thrown into one. The windows will be glazed with cathedral glass. A small recess will be left for the organ, and a minister's vestry will be provided at the back. The dimensions of the chapel will be:—Height, 30 ft.; length, 33 ft.; and width, 24 ft. The school will be 18 ft. by 24 ft. By the door will be an entrance porch and lobby, and the school and chapel will be approached by the same entrance. The woodwork of the interior will be red deal, stained and varnished, and the roof principals will also be stained and varnished. The architect is Mr. Ewen Harper and the builder Mr. W. Hopkins, both of Birmingham.

NEW BAPTIST CHAPEL AT CARDIFF.—On the 7th inst. a new Baptist chapel was opened at Cardiff. The new chapel fronts Pearl-street, and is of stone. Internally it is fitted with pitch-pine pews estimated to seat 340 persons. The chapel has been built by Mr. Augustus Lewis, of Cardiff, from plans prepared by Mr. Justin Hutchins, Cardiff, the cost being 1,265*l.*

SUNDAY SCHOOL BUILDINGS, BURY ST. EDMUND'S.—On the 8th inst. the memorial-stone of the new Sunday Schools in connexion with the Baptist Chapel was laid at Bury St. Edmund's. The site of the schools is immediately opposite the Baptist Chapel in Garland-street. The new buildings will contain a room, which will be available either for the work of the Sunday School or as a hall for lectures or public meetings. It will be floored with solid pitch-pine flooring blocks, and will have an open-timber roof with dormer lights. There are also five class-rooms, four of which adjoin the main school and one over the entrance-porch. The buildings are being erected of brick, and will be covered in with slate roofs, and will be faced with Suffolk bricks and freestone dressings. It is proposed to warm the building on Grundy's warm-air system, and to ventilate it with automatic roof-exhaustible ventilator. The work is being carried out by Mr. J. Williams, of Bury St. Edmund's, under the direction of Mr. John E. Sears, of London.

PROPOSED RESTORATION OF EAST RUSTON CHURCH, NORFOLK.—According to the *Eastern Daily Press*, this church is about to be restored. It is a spacious building, consisting of an unusually large nave, chancel, south aisle, and porch. The tower contains one bell, and was formally surmounted by a spire. It also had a north aisle, which has been removed. The chancel was restored by the Ecclesiastical Commissioners about three years ago. The restoration about to be carried out from the designs and under the direction of Mr. A. S. Hewitt, of Great Yarmouth, will be the reseating and reflooring of the nave, and the insertion of six new windows, the present ones being plain wooden frames.

## *SANITARY AND ENGINEERING NEWS.*

LONG EATON WATER WORKS.—The important work on which the Long Eaton Local Board have been for over three years engaged, in endeavouring to obtain a pure and plentiful supply of water for their district, reached one of its final stages on Thursday last week, when the opening ceremony was performed at Stanton-by-Bridge. The town of Long Eaton is situate on the alluvium of the Trent Valley, close to the junction of the Rivers Erewash, Derwent, and Soar with the Trent, but all these streams, as well as their tributaries, are so polluted by sewage as to be quite out of the question for a town supply, whilst the subsoil is composed of the red marl of the Trias, interspersed with beds of gypsum, which yields a water of upwards of 110 degrees of hardness. The works were, therefore, put down at Stanton-by-Bridge, in the parish of Melbourne, twelve miles distant from Long Eaton. A well, 11 ft. in diameter, was sunk in the Millstone Grit, and adits or tunnels, 6 ft. high by 5 ft. wide, were driven in various directions from the well for collecting the water, the total length driven being 2,250 ft. From the commencement of the well-works to their completion in March, 1891, a period of eleven months, the pumping operations went on without cessation, the quantity pumped gradually increasing to 880,000 gallons per day. The machinery has been supplied under contract by Messrs. Tangyes, of Birmingham. It consists of two horizontal tandem compound surface condensing engines of the latest type, having every improvement to secure economy of working. The high and low pressure cylinders are respectively 10½ in. and 30 in. in diameter by 32-in. stroke, and each drives by spur mortice-gearing a pair of 14-in. bucket and plunger pumps, which raise the water to tanks outside the building, and two 10-in. double-acting force-pumps driven off the same cranks, which raise the water to the reservoir at Castle Donington, about five and a-half miles distant. Steam is supplied by two Lancashire boilers at a working pressure of 110 lbs., and the engines are capable of pumping 60,000 gallons of water per hour, which is 4,000 gallons in excess of the contract. The reservoir at Castle Donington is 212 ft. above the Market-place at Long Eaton, and has a capacity of 500,000 gallons. It is circular on plan, 75 ft. in diameter, and is constructed of brickwork in cement, surrounded by an envelope of puddle, and covered by brick arches, on which rests 2 ft. 6 in. of earth. One of the main objects in view in the design of the works has been the protection against fire of the large lace factories upon which the prosperity of the town depends, and for this purpose mains of large size have been carried round the factories, having upon them at frequent intervals 4 in. double outlet fire hydrants, under a constant pressure of 212 ft. of water, from which powerful jets can be thrown on to the roofs of the highest factories. The heavy expenditure entailed by the distance of the works from Long Eaton has been to some extent lightened by the fact that the mains pass through Melbourne, Kings Newton, and Castle Donington, which were in need of a water-supply, and agreements were made with the authorities of these towns to buy water in bulk from the Local Board. Melbourne is supplied direct from the pumping main whilst the machinery is running, and at other times from the reservoir at Castle Donington, and a separate main in direct connexion with the reservoir supplies Castle Donington. The cast-iron mains, amounting to 31½ miles, have been supplied by the Stanton Iron Company, and the valves and fire apparatus by Messrs. J. Blakeborough & Sons, of Brighouse. The general contractors for Long Eaton and Castle Donington were Messrs. Price & Shardlow, of Nottingham, and for Melbourne and King's Newton, Mr. G. F. Todd, of Derby. The amounts of the estimates sanctioned by the Local Government Board were for Long Eaton, 39,767*l.*; for Melbourne, 3,000*l.*; for Castle Donington, 2,000*l.*; and in each case the work has been executed within the estimated amounts. At the opening ceremony last week, the key of the engine-house was presented by the Engineer to the Chairman of the Local Board (Mr. Joseph Orchard), who opened the door and started the No. 1 engine, the No. 2 engine being started by Mr. Thomas Smith, the oldest member of the Board.

PURIFICATION OF LANCASHIRE RIVERS.—The work of improving the condition of the Irwell and the Mersey is slowly but surely progressing, and several authorities have recently moved in the matter. Last week the Mossley Town Council had the question under consideration, and the Rivers Pollution Prevention Committee submitted their report. It was decided to engage Mr. Theo. S. McCallum, C.E., of Manchester, to prepare a scheme for the interception and purification of the sewage of the town, with the view of obtaining the early sanction of the Local Government Board for the necessary borrowing powers.

THE SEWAGE QUESTION IN THE WEST RIDING.—The Pontefract Rural Sanitary Authority have taken up in earnest the solution of the sanitary difficulties presented by their important district, which occupies a large section of the rapidly-advancing West Yorkshire coalfield. It is, in fact, due to this coalfield that increasing populations imperatively demand efficient drainage and water-supply. That the difficulties are not slight may be inferred from the fact that the rivers Aire and Calder, at a point below their confluence, intersect the Authority's district where the current is most sluggish, the river being dammed up with pools or navigable reaches four or five miles in length. Those acquainted with hydraulic questions will appreciate the importance of this obstacle, especially where scattered rural populations are to be drained. In March last the Authority received a scheme for the drainage and sewage treatment of Burton-Salmon—an entirely agricultural township—at a cost of 1,500*l.* This scheme, which, small as it is, involves a pumping lift of some 10 or 12 ft., has been accepted by the township. In May, a scheme for the drainage of Brotherton township, at a cost of 2,700*l.*, was received, which also involved pumping; while, on the 10th inst., three alternative schemes were submitted for the drainage of Glasshoughton township, at a cost varying from 3,000*l.* to 4,000*l.* Two of these schemes are for combining respectively with the adjacent districts of Castleford and Whitwood by discharging the bulk of the sewage into their respective sewer systems at a fixed charge per house; and the third is for dealing with the bulk of the sewage within and by the township itself. This self-contained scheme was recommended by the Authority's Engineer, Mr. Malcolm Paterson, of Bradford, as by far the most efficient and economical. In this case the three alternative schemes are by gravitation only, so far as the town-

ship itself is concerned, but the Castleford system, which also was designed in 1875 by Mr. Paterson, involves a lift of no less than 60 ft. Incidentally in the Engineer's report it was mentioned that during the past year alone the population had increased 18 per cent., and this was attributed to the operation of the newly-completed water-supply. In all the above schemes it is proposed to treat the sewage on land, which is undoubtedly the best resource in rural districts.

## *STAINED GLASS AND DECORATION.*

MEMORIAL WINDOWS, LICHFIELD.—Two memorial windows have just been placed in the north aisle of St. Mary's Church, Lichfield. One is to the memory of Mrs. Scott, the wife of the Vicar, the Ven. Archdeacon Scott, and is the gift of the parishioners and citizens. The second is erected by Mr. Higgins, of Chicago, to the memory of Mr. and Mrs. W. T. Higgins, his parents. The first window represents the Adoration, and the second the Annunciation. Both are the work of Mr. Kemp, of London.

MEMORIAL WINDOW, ST. AGNES CHURCH, BRISTOL.—The dedication of the east window of St. Agnes Church, Bristol, which has been filled with stained glass, in recognition of the work done in the parish by the Rev. E. A. Fuller, took place on the 10th inst. The subject with which the window is filled is that of the Crucifixion, and the work has been carried out by Mr. W. O. Heming, of London.

STAINED GLASS WINDOW, SOUTH LEITH PARISH CHURCH.—The west window of South Leith Parish Church, Edinburgh, has just been filled with stained glass to the memory of the late Dr. James Struthers. The treatment selected was one in which the two subjects—"Moses raising the brazen serpent," and "Christ healing the sick," each extend through the upper portion of three openings. Below are portrayed smaller subjects of the six acts of mercy. These are placed within ornament of an architectural character, and the tracery is filled with angels upon a foliated ground. The window is from the studio of Messrs. A. Ballantine & Gardiner, Edinburgh.

## *FOREIGN AND COLONIAL.*

FRANCE.—On account of the steady falling off of the pensioners of the Hôtel des Invalides, the Government intends to petition Parliament to give up the whole Hôtel to different public works, civil and military, and give the few remaining "Invalides" a retiring pension, as has been done at Greenwich. There is also a talk of transferring the Minister of Finance from the Louvre to the Invalides, and also of increasing in no small degree the galleries of the National Museum. If this project is carried out, the church where Napoleon's remains lie will be turned into a sort of Military Pantheon, devoted to the illustrious generals who have died in the service of France. ——Models of all the principal French monuments which are in the Trocadéro Museum are being made for the Chicago Exhibition.——The destruction of the Palace of St. Cloud is going on rapidly. The State has retained the twelve statues decorating the façade of the Court, three only of which are intact. It is said that the Duc de Nemours has bought two frontals, on which are the arms of the Orleans family. The large balcony in wrought iron, which overlooks the private garden, has been bought by the Count Pozzo di Borgo, who has already rebuilt a part of the Tuileries in Corsica. The sculptures of the chapel are still to be sold.—— A monumental Mairie is to be built at Levallois Perret, near Paris; it is to be surrounded by a square, with fountains.——On September 22, the monument to the painter Millet (whose picture of the "Angelus" has become so famous) is to be inaugurated at Cherbourg. The monument consists of a granite stele on which stands the bust of the artist, carved by Chapu. At the base of the monument are two subjects in bronze by M. Bouteiller, pupil of M. Falguière; on one side, the attributes of Painting; on the other a peasant with a child in her arms, who offers a palm to the artist.——The works for the installation of the new Hôtel des Postes et Télégraphes, at Bordeaux, have just been begun. The hôtel occupies the site of the old Hôtel des Monnaies, which was built in 1757 by the architect Portier, and which is a fine specimen of the architecture of the eighteenth century.—— The Baron Alphonse de Rothschild has just presented to the Montpellier Museum a frame containing forty-seven medals by M. Jules Chaplain, Member of the Institute.——The new public hall of the Montpellier Museum has just been opened to the public. It is to be specially devoted to the cartoons and designs of Alexandre Cabanel, whose bust, by M. Paul Dubois, stands in the centre of the hall.——M. Eztrade, a civil engineer, and pupil of the École Centrale, who has lately died, has left all his immense fortune to the Institute of France. ——The engineers of the Ville de Paris are contemplating a project of using the waters of the pretty little river "Loing" which flows into the Seine at Moret, for the supply of the capital.—— During some alterations in the roads at Lyons the foundations of the Church of St. Etienne, in the Rues St. Etienne and d'Estrées, have been brought to light. It had been demolished in 1797. Several pieces of sculpture have been found, amongst them a monumental statue in coloured stone, representing a cavalier, in coat-of-mail, with a dirk by his side.——In order to give some employment to the workmen of Hâvre, who have been thrown out of work by the cholera epidemic, the Minister of Public Works has ordered the immediate commencement of the line, which is to connect Hâvre and Dieppe.——The centenary of the proclamation of the first Republic will be celebrated by a fête on September 22. The organisation of the cortège has been entrusted to M. Bouvard, the new Inspector of Architecture of the Ville de Paris.—— A committee has been formed in Paris to erect a statue to the poet Charles Baudelaire. The sculptor Rodin is to make the monument.—— At Meudon-Bellevue (near Paris) a rope railway is in course of construction, to go from the Seine to the Terrasse de Meudon. It will be opened next spring.——A competition between architects and sculptors has been opened at Dunkerque (Nord) for the erection of a monument commemorating the siege of the town in 1793.——The Municipal Administration of Paris is building a new hospital on the Place du Danube (Nineteenth Arrondissement), which is to receive the overflow of all the other hospitals in Paris.

BUDAPEST.—A competition has been opened for the design of a new central market-hall, which is to have some 500 or 600 stalls. The competition is an "international" one, but unfortunately all nomenclature has to be in Hungarian. There will be fifteen jurymen acting as assessors, and of these we would mention the City Architects of Berlin and Leipsic, a French engineer, and a German mart expert in market building, as non-Hungarians. Five premiums are to be given, three of 2,000 florins and two of 1,000 florins. The author of the design considered best will have the commission to carry out the building. There is to be a public exhibition of all drawings sent in.

BULGARIA.—At Philippopolis the first Bulgarian National Exhibition has been opened. The site is outside the town, and has a superficial area of some 100,000 square mètres. According to an Austrian contemporary the provisional buildings put up, consisting of a dozen main pavilions and forty-five minor ones, make a very good show as far as construction and architectural decoration is concerned. They are said to have a *bonâ-fide* provisional nature, the constructional parts being of timber, and the surfaces canvas painted in various designs.

ST. PETERSBURG.—There is to be a Hygienic Exhibition in the capital next spring, and it is said that the Czar wishes to see special attention paid to the divisions devoted to practical sanitation.

BERLIN.—When the German Emperor decided to let the Berlin International Exhibition question drop, several competitions had already been opened with the purpose of obtaining proposals as to site and the laying out of the grounds. The promoter of the most important of these competitions was the "Vereinigung Berliner Architekten." The committee managing this competition has now made known to intending candidates for their prize that they expect the Emperor's ruling not to have any effect on the work, that the sending-in day is to be a fortnight later than first intended, and that the premiated design will serve as a most valuable basis for the preparation of a new scheme of the exhibition, which is to be taken in hand as soon as practicable.—— The almalgamated societies of architects and civil engineers can this year boast of having 6,784 members, belonging to thirty different societies. The senior "Architekten Verein," at Berlin, heads the list of societies with 1,849 members. At the special business meetings held at Leipsic, prior to the gathering, twenty-six societies were represented by fifty official delegates. Herr "Baurath" Hinckeldeyn, of Berlin, was elected to hold the chair for 1893, and "Stadtbauinspector" Pinkenburg will act as hon. secretary. Among the subjects to be taken in hand next year will be the framing of a new set of general regulations for competitions. Of the subjects which are shortly to be treated, we may mention (1) the diminution of smoke and soot in towns, (2) the qualities of so-called "fireproof" materials, (3) the advisability of using the gas-pipes of a house as lightning conductors.——According to a local paper at Kiel it now appears that if no unexpected hindrance takes place the North Sea-Baltic Canal can be opened in the autumn of 1895. Two million cubic mètres of ground are being moved every month, and the stone embankments and bridges are progressing more favourably than was expected. It has now been determined that the canal is to be lighted by electricity, to facilitate the working of night traffic.

DENMARK.—The Danish Rigsdag has refused to make any grant towards the rebuilding of the celebrated historical Christiansborg Palace, destroyed by fire some years ago. The Danish Government has appointed a commission to consider the great building schemes now before it respecting Copenhagen. The list is as follows:—Rebuilding of Christiansborg Palace, a new House of Parliament, rebuilding of the Prince's Palace, new central railway-station, new barracks for the Foot Guards, removal of the arsenal, new barracks for the Life Guards, new buildings for the Royal Archives and the National Library, a new observatory, enlargement or rebuilding of the Theatre Royal, and two gymnastic establishments for teachers and University students. Moreover, the Municipality of Copenhagen has under consideration plans for the building of a new Town-hall.——A press war is raging over the so-called restoration of the old Gothic Maribo Cathedral. In 1864 the interior and exterior were restored by the well-known architect and archæologist, Professor Hözen, the interior being painted a light yellow, with red for the bases of column, the arches of the dome, &c., and the church authorities now desire to whitewash the whole interior. Against this the Maribo citizens strongly protest, and a commission has been appointed to consider the question. The excavations of the ruins of the historical Vordingborg Castle are being continued, but as yet very little of interest has come to light, but discoveries of considerable archæological interest are anticipated.——During the past summer the frescoes in eight village churches in Jutland have been restored. They all date from the early part of the Christian era.——At the General Meeting of the Technical Society of Copenhagen, the representative society of Danish architects and engineers, it was announced that the members number 578. The society had offered its annual prize of 500 kr. for the best essay "On Workmen's Dwellings Abroad and at Home, with Technical and Hygenic Rules for the erection of such," but none worthy of the prize had been received. The Society had, therefore, commissioned Herr Olaf Schmidt, architect, to prepare the essay.——The work on the new great harbour in course of construction at Copenhagen is being pushed on with great vigour.

SWEDEN AND NORWAY.—The present and last year has witnessed a complete standstill in building operations in Stockholm, being, no doubt, a reaction caused by over-speculation in preceding years. The number of dwellings at present unoccupied in Stockholm is unprecedentedly large.——In consequence of the great number of falls of roof scaffoldings in Stockholm of late, the City Architect and the Board of Works have proposed to the Municipal Authorities the adoption of a series of more stringent rules in connexion with such structures. ——Prof. Julius Kronberg, the celebrated Swedish painter, who has recently finished the huge frescoes on the grand staircase of the royal palace, has been commissioned by King Oscar to continue the work up the second stairs.——The granite quarries of the Kullgren Company have been purchased by a German firm. They comprise extensive areas of red and black granite in the south of Sweden.——The new Gothenburg waterworks are approaching completion, and it is expected that they may be taken into use before the coming of winter. They will furnish the city with a copious and excellent supply of water.——We referred recently to a project for supplying the city of Gothenburg and district with electricity for motive and lighting purposes from the great Trollhätta Falls, and from a canvass made it appears that the demand will amount to 5,262 horse-power, for 8,395 glow and 178 arc lamps. The undertaking is, therefore, secured.——Several new monumental public buildings are to be erected in Christiania, the most important being the new Government offices, which are to cost about 100,000*l*., and an Historical Museum to cost about 35,500*l*. Both buildings are to be ready in 1896. A third building is the new Customs House, upon which work is now actively progressing.——The General Post-office is also being rebuilt at a cost of 17,000*l*., and will be ready next summer. The new building will be heated by steam and lighted by electricity. The architect is Herr Nordan.——Another striking building in the Norwegian capital is the Vollman Bazar, erected on the site of the one burned down last spring. It is a handsome structure of four stories, in the construction of which variegated kinds of Norwegian granite,—grey, red, black, &c., have been introduced most effectively. It is heated by steam and lighted by electricity. The cost of the building is 12,500*l*., and the heating and lighting apparatus 2,500*l*.—— The Christiania Cement Company,—the only one in Norway,—has been transferred to a syndicate for a sum of 21,000*l*.——The Norwegian Association of Engineers and Architects has presented an address to the Government urging the employment of professionals only on juries in the case of questions of a technical nature.

THE DANUBE.—The great works of regulating the Danube at the so-called "Iron Gate" by Orsova are rapidly progressing. Extensive mining with dynamite has taken place, including eleven "monster" blastings. The quantity of rock removed from the watercourse is about 1,000 cubic mètres a day. The hands engaged upon the work number over a thousand. The work is to be continued unabated during the winter.

RUSSIA.—A large new harbour has just been completed at Libau.——The Finnish Government has voted a sum of 12,200*l*. for completing the harbour works now carried out in the port of Hangö, in the Finnish Gulf, and the erection of a Customs' depot.——The Russian department of communication has prepared plans for a canal between the rivers Dnieper and Dwina. Its cost is estimated at about 650.000*l*. This waterway would establish connexion between the Baltic and the Black Sea,

# COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

| Nature of Work. | By whom Advertised. | Premium. | Designs to be delivered. |
|---|---|---|---|
| *Technical Schools | Swindon Local Board | ..... | Dec. 1 |

## CONTRACTS.

| Nature of Work or Materials. | By whom Required. | Architect, Surveyor, or Engineer. | Tenders to be delivered. |
|---|---|---|---|
| *Brick and Pipe Sewers | St. Pancras Vestry .. | W. N. Blair | Sept. 19 |
| *Broken Granite | East Ham Local Bd. | —Savage | Sept. 20 |
| Heating Apparatus, &c. | Knaresborough Union | *Official* | do. |
| Work at North Bridge | Halifax Corporation.. | E. Escott | Sept. 21 |
| *Brick and Pipe Sewers, &c. &c. | Skipton U.R.S.A. | A. E. Preston | Sept. 22 |
| *Additions to Mess Room, Derby | Midland Railway | *Official* | do. |
| *New Goods' Shed, Morecambe | do. | do. | do. |
| *Fifteen Cottages, Westhouses | do. | do. | do. |
| *Paving Works | Walthamstow Loc. B. | G. W. Holmes | Sept. 23 |
| *Converting the Old Laundry at Infirmary | St. George-in-the-East Guardians | Wilson, Son, & Aldwinckle | do. |
| *Purchase of Stone Crusher | Vestry of St. Mary, Battersea | *Official* | do. |
| *Removal of Dust, Ashes, &c. | do. | J. T. Pilditch | do. |
| Swimming Bath, &c. | Exeter Tepid Swimming Bath Co. | Ralling & Tonar | Sept. 24 |
| *Labourers' Dwellings | Manchester Corp. | Spalding & Cross | Sept. 26 |
| Sewering, Channelling, Paving, &c. | Elland Local Boar t | G. Hepworth | do. |
| *Effluent Conduit | Burton-on-Trent Corp. | *Official* | do. |
| *Cast-Iron Pipes | do. | do. | do. |
| *Block of Dwellings, Poplar | London County Council | do. | Sept. 27 |
| *Enlargement of Chrysanthemum House, Southwark Park | do. | do. | do. |
| Police Station, Dartmouth | Devon Standing Joint Committee | do. | do. |
| *Broken Granite, Steam Rolling and Scarifying | Edmonton Local Bd. | G. E. Eachus | do. |
| *Construction of Four Subsiding Tanks, Pumps, &c. | Southampton Corp. .. | W. Matthews | do. |

## CONTRACTS.—*Continued.*

| Nature of Work or Materials. | By whom Required. | Architect, Surveyor, or Engineer. | Tenders to be delivered. |
|---|---|---|---|
| *Sewerage Works | West Ham Council | Lewis Angell | Sept. 27 |
| *Oak Fencing and Gates | do. | do. | do. |
| *Erection of Battery, Drill Shed, &c. | Admiralty | *Official* | Sept. 30 |
| *Refuse Destructor Cells, &c | Leicester Corp. | E. G. Mawbey | do. |
| *Engine, Boiler, &c. | do. | do. | do. |
| New Cliff Road, Martinhoe, Barnstaple | ..... | G. C. Smyth Richards | do. |
| *Laying Surface-water Sewer, Making-up Road, &c. | Hanwell Local Board | S. Barnes | Oct. 3 |
| *Supply of Materials | G. W. R. Co. | *Official* | do. |
| *Works of Main Drainage | Belfast Corporation .. | do. | Oct. 4 |
| *Additional Storey, G. P. O. East | Com. of H. M. Works | do. | do. |
| *Making-up Roads | Tottenham Local Board | J. E. Worth | do. |
| *Sewerage Works, Bushey | Watford U.R.S.A. | Urban Smith | do. |
| *Widening Railway, Cornwall | G. W. R. Co. | *Official* | Oct. 5 |
| *Central Station, Bristol | Bristol U.S.A. | H. Williams | Oct. 10 |
| Steel Warehouses, Sheffield | G. Senior & Sons | W. H. Lancashire | No date |
| Additions to School Buildings, Thorpe Hesley, near Rotherham | ..... | G. A. Wilson | do. |
| Coal Staiths, Newcastle-on-Tyne | East Holywell Coal Co. | ..... .. | do. |
| Colliery Sidings, Bruntcliffe, near Leeds | Victoria Collieries | ..... | do. |
| Six Houses, Dial-street, Leeds | Naylor & Dwyer | ..... | do. |
| Warehouse, Offices, &c. Leeds | Burgon & Co. | T. Butler Wilson | do. |
| Alterations, &c. Hermitage Lodge, Chester-le-Street | Lindsay Wood | G. A. Kerrick-Walker | do. |
| Six Cottages, Sleekburn, Newcastle-on-Tyne | S. Bewley | ..... | do. |
| Alterations, &c. Town Hall | East Stonehouse L. B. | H. J. Snell | do. |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Advertised. | Salary. | Applications to be in. |
|---|---|---|---|
| *Sanitary Inspector | St. Pancras Vestry .. | 120*l.* | Sept. 24 |
| *Surveyor and Inspector of Nuisances | Bexhill Local Board.. | 175*l.* | Oct. 8 |
| *Second Class Assistant Surveyor | Civil Service Com. | ..... | Oct. 13 |

*Those marked with an Asterisk (*) are advertised in this Number.* *Competition, p.* iv. *Contracts, pp.* iv., vi., vii., *&* viii. *Public Appointments, p.* xviii.

and therefore become of great commercial importance.——The Moscow Section of the Imperial Technical Society has obtained permission to hold an exhibition of fireproof building materials in that city next spring, to be open six months. There will also be a show of fire-extinguishing apparatus.

## *MISCELLANEOUS.*

SUB-CONTRACTING AND THE TRADES UNION CONGRESS.—At the meeting held on the 7th inst. of the Trades Union Congress, which has been holding its meetings this year in the City Hall, Glasgow, Mr. Harvey submitted the following resolution:—"That the system of sub-contracting allowed and sanctioned by the Government on their works is in direct violation of their promises as given in the House of Commons, and that our delegate be instructed to press the matter in Congress with a view of giving such a distinct breach of faith into the Parliamentary Committee's hands to deal with." In supporting the resolution, Mr. Harvey adduced a number of instances in which Government work had been carried through by sub-contractors, and carried through in the most scandalous manner. These sub-contracts were recognised by Government officials. In the case of a certain Post-office, the First Commissioner of Works was appealed to on the subject. He appointed an expert, who examined the work and condemned the greater part of it, yet he (Mr. Harvey) was informed that the work remained unaltered. Then, again, in the case of certain new Police-courts, a communication had been received from the First Commissioner of Works stating that the wages paid were 9d., 9½d., and 10d. an hour. There was, however, evidence to prove that such wages were never paid, and that the conditions of the work were nothing less than sweating. He hoped the Congress would instruct the Parliamentary Committee to adopt such measures as would prevent the recurrence of sub-contracting in connexion with Government works.—Mr. Gibbs, London, seconded the amendment.—Mr. P. J. King proposed the addition to the resolution of the following words:—"And that where sub-contracting, which we emphatically condemn, is allowed either in public or private works, the sub-contractor be called upon to give security so as to protect the employés in case of accident, as provided in the Employers' Liability Act."—Mr. John Ward, London, seconded the proposed addition. The Employers' Liability Act, as it stood, was a dead letter to a man who got injured under such conditions. The sub-contractor should be required to give security that he was able to pay legitimate compensation that might be claimed from him in respect of injury to his workmen.—Mr. King's amendment was then put to the meeting, and carried by a large majority. It was added to the resolution.—Mr. Ross, Manchester, moved, as an additional amendment, that after the word "works" there be added the following clause:—"Or in issuing Government orders to sub-contractors." The amendment, having been seconded, was adopted.—Mr. M'Bean, London, moved, as a further amendment, that at the end of the resolution there be added the following clause:—"And that the committee be likewise instructed to wait, by deputation, upon the First Lord of the Treasury, to remind him of the promise made by his predecessors in office regarding the abolition of sub-contracting on Government contracts."—This amendment was accepted by the meeting, and the entire resolution, as amended, was then put to the meeting, and agreed to.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The Council of the Birmingham Architectural Association have, we understand, recently issued circulars to the members intimating that they have completed arrangements with the School of Art by which the educational work of the Association will be brought into connexion with the School in such a manner as will, it is hoped, give greater facilities for the study of architecture. The scheme is one by which the School of Art and the Architectural Association combine to undertake a special course of architectural classes and lectures for the purpose of giving a student in four years all that he needs in the early years of his career, the historical subjects being dealt with at the School of Art, and the technical subjects at the Association meetings. In order to make the course as thorough as possible, special lectures have been arranged for in addition to the classes already held at the School of Art, and the Association meetings have been rearranged and strengthened as far as possible.

PLUMBERS' REGISTRATION MOVEMENT.—The third annual Congress of Scottish District Councils for the National Registration of Plumbers has just been held in the Town Hall, Dundee. Lord Provost Mathewson presided, and there was a very good attendance of representatives of the principal municipal, sanitary, and educational authorities of Scotland, in addition to a very large number of representative master and operative plumbers, architects, sanitarians, &c., from all the chief cities and towns of Scotland. Councillor Currie, Dumfries, moved that Municipal and County Health Authorities should be recommended to frame and enforce by-laws under the Public Health Acts for the better construction of plumber work in all sanitary appliances; that, where practicable, they should consult the Central or District Council for the National Registration of Plumbers in framing such by-laws; and that, wherever possible, a qualified registered plumber should be appointed to supervise the carrying out of such work. Bailie Stephenson, Dundee, seconded, and after some discussion the resolution was unanimously adopted. Mr. John Grierson, Town Clerk, Dumfries, moved, "That in the opinion of the Congress it is important that the resolutions adopted by the Congress, and the views expressed by the representatives of the District Councils should be formulated, and that a statement embodying these views should be presented as a memorial to Parliament; and further, that the members of the Congress should urge upon their several representatives in Parliament the importance of their supporting the Registration Bill and expediting its passing into law." This resolution having been supported by Mr. W. P. Buchan, master plumber, of Glasgow, and others, was carried unanimously.

EXTENSION OF THE ABERDEEN GAS WORKS.—Extensive additions to the Aberdeen Gas Works, estimated to cost 80,000*l.*, were sanctioned by the Aberdeen Town Council on the 5th inst. In order that the works may be carried out applications will be made to Parliament in the ensuing session for a Bill to authorise the Council to borrow an additional sum of 90,000*l.* in connexion with the gas undertaking. The Council had before it reports on the proposed works by Mr. Samuel Stewart, Greenock, and Mr. Alexander Smith, the Aberdeen gas manager. According to these, the bench containing eighty retorts, heated by the open furnaces, will be reconstructed, so as to contain 128 retorts on the regenerative system. This alteration will give retort power for about four years. The present gasholder capacity is 2,100,000 cubic ft., while the largest daily consumption last winter was 2,300,000 cubic ft., showing already a deficiency in storage power of 200,000 cubic ft., and to remedy this there will be erected an additional gasholder of at least 3,000,000 cubic ft. capacity. Another retort-house, to contain 224 retorts, will be built alongside the present one; and an additional purifier-house, scrubbers, and condensers will be built as required. When these extensions are carried out, the gas-producing power at the works will be increased from 384 to 656 retorts.

THE ABERDEEN ELECTRIC LIGHTING SCHEME.—The Town Council of Aberdeen discussed on the 5th inst. the recommendation of the Gas Committee that the Corporation should proceed with the lighting of the eastern district of the city at an estimated cost of 24,000*l.* Professor Kennedy, London, who had been consulted, reported that the compulsory area should include Castle-street, Union-street, as far west as Bon-Accord-street, Market-street, Broad-street, St. Nicholas-street, the southernmost block of George-street, Schoolhill, and the circuit round the new road by the Free Library, and down Union-terrace. About 10,000 lamps of 8-candle power would be installed, of which about 7,000 would be in the eastern and 3,000 in the western district. The central station will be located in Cotton-street. On a division it was resolved by 24 to 5 to proceed with the lighting of the eastern district as indicated in the report, and it was remitted to the Gas Committee to have the scheme carried into effect.

THE ENGLISH IRON TRADE.—Little change has occurred in the English iron market. The general tone of business at the various pig-iron centres is quiet; but prices on the whole are maintained. In the Cleveland district, however, further reductions are recorded. In the finished-iron branch dulness prevails. Black sheets and hoops are 2*s.* 6*d.* per ton lower. In the tin-plate trade matters continue in a depressed state. In steel there is little doing, and values remain unchanged; but in Scotland sales of ship-plates are reported at 5*l.* 7*s.* 6*d.* net, probably the lowest price recorded. Engineers and shipbuilders are in receipt of few new orders. The coal trade is still somewhat inactive.—*Iron.*

GLOUCESTER CATHEDRAL CLOCK AND CHIMES.—The old clock which has been in the tower of Gloucester Cathedral for several hundred years, has been taken out and replaced by a large clock chiming the Westminster quarters on four bells, and striking the hours on the large bell Peter, the hammer of which has been made four times as heavy as it originally was, thus bringing out a full tone from the bell. The pendulum is 14 ft. long, is about 300 lbs. in weight, beats once in two seconds, and is compensated for atmospheric influences. All the wheels are of best hard gun-metal, with teeth cut out of the solid. It is fitted with a maintaining

power to keep the clock in action during winding. The main wheel is fitted with powerful iron cam for direct action in lifting the heavy hammer of the large bell. The movement is mounted on a horizontal iron frame with planed bearings, and all the bushes are screwed and bolted on to the frame, so that any part can easily be removed for repairs or cleaning without taking the whole clock to pieces. This clock when settled down is guaranteed to maintain true time with less variations than fifteen seconds per month. The carillon or chiming-machine was made about the fourteenth century, and is a marvel of mechanical ingenuity for that age. It has been entirely reconstructed, with all improvements up to date added to it. It is set in action by the clock, and chimes the same four tunes it has done since 1680 on a peal of eight bells and the large bell Peter. There is a register in existence notifying that it was repaired by Thomas Loveday, bell-founder, in 1527, and four of the peal of eight bells were cast by Master John, of Gloucester, in 1345. The old oak frame (which somewhat resembles an ancient four-post bedstead) has been replaced by a new one made of steel. The whole of this work has been carried out by Messrs. Sainsbury Bros., of Walthamstow.

## *CAPITAL AND LABOUR.*

THE CARPENTERS' STRIKE IN BELFAST. — The dispute which has been in existence for some time between the carpenters and the master builders of Belfast, was, says the *Belfast News Letter*, settled on the 9th inst. At the recent interview between the employers and a deputation on behalf of the carpenters, an increase of a farthing was offered, bringing the wages up to 7¾d. an hour, and the men have agreed to accept these terms, the question not to be raised again until 1894. The original demand was 8d. an hour. It should be stated that the settlement is at present confined to the carpenters, and that the position of the plasterers is not affected.

END OF THE BRICKLAYERS' STRIKE AT BROMLEY. —After a strike which has lasted over five weeks, the bricklayers in Bromley returned to work on Monday, having obtained their request for ½d. per hour extra.

## MEETINGS.

SATURDAY, SEPTEMBER 17.

*Architectural Association.*—Visit to Loseley Park and Guildford. Train leaves Waterloo at 1.55 p.m.

*Glasgow Architectural Association.*—Visit to Bardowie Castle and Mugdock Castle.

TUESDAY, SEPTEMBER 20.

*Glasgow Architectural Association.*—Mr. Campbell Douglas on "A Tour in Spain and Portugal." 8 p.m.

WEDNESDAY, SEPTEMBER 21.

*Builders' Foremen and Clerks of Works' Institution.*—Ordinary meeting. 8.30 p.m.

SATURDAY, SEPTEMBER 24.

*Liverpool Engineering Society.*—Visit to the Liverpool Overhead Railway Works, and the Liverpool Hydraulic Power Company's Works.

## RECENT PATENTS:

### ABSTRACTS OF SPECIFICATIONS.

13,010.—TILES: *H. L. Doulton and J. M. Carr.*—This patent relates to an improved form of tiles for covering roofs and other surfaces, and methods of fixing the same. The tiles are made of any suitable materials, and of any convenient size,—say 9 in. square,—and may be of any required curved or straight form on the outside face, with any desired ornamental patterns impressed, raised, or otherwise produced on the surface. On the back of the tile a dovetailed groove or recess is formed in its thickest part, and a dovetailed projection on its thinnest part, those dovetailed parts occupying about half of the back surface of the tile, the remainder being a flat plane, or it may be a curved surface for special positions. At the thick edge of the tile a shoulder or a rebate sinking may be formed to receive the thin edge of the next tile. The mode of covering the roof and fixing the tiles are fully set out in the specification.

14,060.—CISTERNS: *Hy. Bartlett.*—This invention refers to syphon-flushing cisterns for water-closets, urinals, &c. The cistern is partitioned off into two compartments, a larger or main compartment and a smaller one. At the base of the partition are inlets at intervals to afford access for the water to the main compartment. The syphon, which is obviously open at its top, is cast in connexion with two, three, or four additional pipes, the casting surrounding and forming the syphon and additional pipes being oblong on the exterior. The stand-pipe, or syphon, is cast longer at its base than the pipes or cylinders at each side of it (which do not touch the floor of the cistern), so that it may be fitted to the floor of the cistern in the usual manner, and thence connected to the external supply-pipe leading to the water-closet or other basin. A plate covers the area of the main compartment of the cistern. In order to lift the plate two perpendicular rods are situated, one on each side, in the direction of its width, the rods being secured by screw-nuts or other suitable means. Connected to the upper end of the rods is a lever having its bearing on the sides of the cistern, and actuated by a chain or otherwise. By the raising or lowering of the plate by means of the lever the water in the main compartment will be acted upon and forced up the pipes or cylinders on each side of the stand-pipe or syphon, and over the top of and down the same, causing thus a vacuum to be formed by reason of the displaced air, so that the syphonage is started, and will not cease until the whole of the water in the two compartments is exhausted, when the cistern refills in the usual way.

15,656.—BRICK AND TILE MAKING: *E. P. Bastin.*—The object of this invention is to construct a rotary machine, which shall mould, press, and emboss bricks, tiles, or other like articles, and also punch and camber such articles when required. For this purpose, the clay, or plastic material, is fed from a pug-mill, roller-machine, or other equivalent means into the rotary moulding and pressing machine, which consists of two adjustable wheels, or rollers, one or both of which may be flanged and mounted in a strong frame, one or both being so constructed on its rim or surface as to form or receive a series of dies with a movable division between each die. When these rollers are rotated, and the clay or other plastic material passed between them, each die in succession receives a portion of the material, moulds, presses, and embosses the same, and delivers the article so formed on the opposite side of the machine. In the case of articles requiring to be curved or cambered, there is attached to the machine a separate roller, or rollers, in such a position as to give the required shape, the rollers being actuated by the friction of the article passing it, or by suitable mechanism. For punching articles, movable punches are attached to each die, actuated by suitable mechanism to remove them out of the way when the article is being delivered.

11,233.—SLIDING WINDOWS: *C. H. Maxsted and A. Bell.*—This invention has for its object improvements in apparatus for preventing the vibration or rattling of sliding windows. A disc (preferably of metal) is employed, flat on one side, but on the other side tapered off or sloping downward from the centre, so as to form a kind of circular wedge, which is held in the required position within a cover or pocket fastened to the window-sash, the arrangement being such that the circular wedge of its own gravity falls or moves sideways into or between the sash and its guide frame, and so takes up any slack between them.

11,813.—WATER-CLOSETS: *S. B. Dix.*—This improvement consists in the construction of a separate apron or covering for a water-closet pan or trap, whereby an existing water-closet or any common pan may take the place of a pedestal closet without using the expensive pans for that purpose. The inside of the apron may, if required, be packed as a preventive against frost.

### NEW APPLICATIONS FOR LETTERS PATENT.

*August* 29.—15,456, W. Gimson, A Tongue and Groove Jointed Roof-tile, Floor-tile, Wall Coping, Drain-pipes, Rain-water Pipes, and applicable to all joints in any kind of material.—15,473, J. Craig and R. Highet, sen., Syphon Discharge Cisterns.

*August* 30.—15,531, S. Wilmot, Fireproof Lathing.—15,548, W. Steel and H. Braham, Sash Fasteners.—15,562, G. Gent, Disinfecting Means for Water-closets, Drain-pipes, &c.

*August* 31.—15,598, J. Cornelius, Sewer Ventilating-shafts, or Chimneys, &c.—15,618, R. Holt, Sash Fastener.—15,621, A. Jones, Window-sash Fasteners.—15,626, W. Glazier and J. Malam, Hinges for Foldings Doors, &c.—15,641, H. Pullen-Burry, Roofs of Horticultural and other Buildings.

*September* 1.—15,661, R. Cochrane, Mosaics, Parquetry, and similar Ornamental Work.—15,715, S Kirk, Windows with Combined Sliding and Hinged Sashes.

*September* 2.—15,770, E. Hargreaves and others, Gulleys and Traps for Sanitary Purposes.—15,794, R. Howard and others, Self-closing Regulating Valves for the Admission of Water to Water-closets, Urinals, Lavatories, &c.—15,800, A. Grist, The Climax Drain and Pipe Testing Plug.

*September* 3.—15,824, W. Middlemiss, Cabinets, &c.—15,836, S. Houghton, Slate Punch.—15,859, W. Hutton, Hydraulic Lifting Jacks and Hydraulic Rams.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

11,410, J. Campbell and C. Cameron, Safety Door or Gate for Hoists or Lifts.—11,412, J. Campbell and C. Cameron, Safety Gate for Hoists.—12,746, W. Freeman, Automatic Flushing Apparatus for House Drains, Sewers, Urinals, Water-closets, &c.—13,357, W. Downs, Stoves.—13,421, H. Bueley, Spirit Levels, &c.—13,809, H. Cunnah and H. Michaux, Metal Laths and Corrugated Iron for all Buildings and Structures, and for Building and Constructive Purposes.—13,856, G. Binswanger and J. Guardia, Electric Bells.—14,481, H. Hateley, Decorating Chandeliers, Gasaliers, lamps, &c.—14,523, J. Kaye, Fastening Swing Doors.—14,839, H. Atkinson, Ovens or Kilns for Burning and Drying Bricks, Tiles, and similar articles of earthenware.

### COMPLETE SPECIFICATIONS ACCEPTED.

*(Open to Opposition for Two Months.)*

14,655, W. Horn, Saw Setting and Filing Device.—18,559, T. Arnold, Utilisation of Slag for the Manufacture of Blocks, Slabs, Drain-pipes, or other moulded articles.—18,735, F. Moore, Paint-burner.—8,040, G. Meager, Construction and Fittings to Window-sashes.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

SEPTEMBER 7.—By *E. E. Croucher & Co.*: Freehold building estate of 1a. 2r. 27 p., Granville-rd., Broadstairs, 1,450*l.*; "Wrotham Villa," Ramsgate-rd., and cottage adjoining, f., 815*l.*; 1, 2, and 3, Church-hill, f., r. 88*l.*, 1,055*l.*; 5 and 6, Wrotham-cres., f., r. 65*l.*, 935*l.*; 9, 10, and 11, Wrotham-cres., f., r. 90*l.*, 1,075*l.*; a plot of f. land, Victory-av., 620*l.*; 1 to 4, Buckingham-st., f., r. 50*l.* 14s., 380*l.*—By *Chadwick & Sons*: 212, Croydon-rd., Anerley, u.t. 71 yrs., g.r. 12*l.* 10s., 290*l.*; 92, Murray-st., Hoxton, u.t. 50 yrs., g.r. 4*l.* 4s., r. 50*l.*, 560*l.*; 4, Breakspeare-rd., Lewisham, u.t. 73 yrs., g.r., 7*l.*, r. 55*l.*, 470*l.*—By *T. A. Hardy*: "The Albany Laundry," Actonlane, Acton, f., 720*l.*

SEPTEMBER 8.—By *P. Hodson*: 52, Hanley-rd., Crouch Hill, u.t. 78 yrs., g.r. 8*l.*, r. 88*l.*, 310*l.*; 56, Hanley-rd., u.t. 78 yrs., g.r. 8*l.*, r. 40*l.*, 330*l.*; 60, 62, and 64, Hanley-rd., u.t. 78 yrs., g.r. 24*l.*, r. 116*l.*, 1,060*l.*; 38, 40, and 44, Grove-rd., Holloway, u.t. 55 yrs., g.r. 24*l.*, r. 104*l.*, 850*l.*; Three plots of f. land, Samos-rd., Penge, 72*l.*; 29, Riversdale-rd., Highbury, u.t. 78 yrs., g.r. 7*l.*, r. 38*l.*, 300*l.*; 4, Wilberforce-rd., Finsbury Pk., u.t. 74 yrs., g.r. 8*l.*, 420*l.*

SEPTEMBER 9.—By *Willats & Charlton*: 76, Stratford-rd., Plaistow, f., r. 38*l.*, 400*l.*; 80, Stratford-rd., f., r. 45*l.*, 610*l.*; 117, East-rd., f., r. 22*l.* 2s., 165*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g r. for ground-rent; r. for rent; f. for freehold; c. for copyhold: l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

## PRICES CURRENT OF MATERIALS.

| TIMBER. | | |
|---|---|---|
| Greenheart, B.G. ton | 9,0,0 | 0,0,0 |
| Teak, E.I... load | 9/10/0 | 15/0/0 |
| Sequoia, U.S. ft.cu. | 2/4 | 3/0 |
| Ash, Canada load | 2/10/0 | 4/0/0 |
| Birch, do. ..... | 3/5/0 | 4/10/0 |
| Elm, do. ..... | 3/10/0 | 4/15/0 |
| Fir, Dantzic, &c. | 1/10/0 | 3/10/0 |
| Oak, do. ..... | 3/0/0 | 5/5/0 |
| Canada..... | 5/10/0 | 7/0/0 |
| Pine, Canada red | 2/10/0 | 3/10/0 |
| Do. yellow .... | 2/10/0 | 5/0/0 |
| Lath, D'ntzic, fath | 5/0/0 | 6/0/0 |
| St. Petersburg | 5 0 0 | 7/0 0 |
| Deals, Finland 2nd & 1st std 100 | 7/10,0 | 9/10/0 |
| Do, 4th & 3rd.. | 7/0/0 | 8/0/0 |
| Do. Riga ..... | 6/10 0 | 8/0/0 |
| St. Petersburg, 1st yellow .. | 10/10,0 | 14/10/0 |
| Do. 2nd yellow | 8/0/0 | 9/10/0 |
| Do. white .... | 7/0/0 | 9/10/0 |
| Swedish ..... | 7/0/0 | 16/0/0 |
| White Sea .... | 8/0/0 | 17/0/0 |
| Canada, Pine 1st | 20/0/0 | 26/10/0 |
| Do. do. 2nd.... | 14/10/0 | 16/0/0 |
| Do. do. 3rd, &c. | 7 10/0 | 10/0/0 |
| Do. Spruce. 1st | 8/10/0 | 11/0 0 |
| Do. do. 3rd & 2nd..... | 6/5 0 | 8/0/0 |
| New Brunswick | 6/10,0 | 7/0/0 |
| Battens, all kinds | 8/10/0 | 15 10 0 |
| Flooring Boards, sq., 1 in. prep. 1st ..... | 0 8/0 | 0 13 0 |
| Do. 2nd..... | 0/7/0 | 0/10/0 |
| Other qualities | 0/3 0 | 0 7/6 |
| Cedar, Cuba ..ft. | /3½ | /4½ |
| Honduras, &c. | /3¼ | /4 |
| Mahogany, Cuba. | /4½ | /6½ |
| St. Domingo, cargo av | /4 | 2/0 |
| Mexican do. do | /4 | /5 |
| Tobasco do. do | /5½ | /7 |
| Honduras do.. | /5½ | /6½ |
| Box, Turkey ton | 4/0/0 | 13/0/0 |
| Rose, Rio..... | 10/0,0 | 20/0/0 |
| Bahia ..... .. | 9 0 0 | 18/0 0 |
| Satin, St. Domingo ....ft. | 0/0 7 | 0/1/3 |
| Porto Rico .... | 0/0/7 | 0/1/6 |
| TIMBER (*continued*). | | |
| Walnut, Italian.. | 0 0/3½ | 0 0/7 |
| METALS. | | |
| IRON—Pig, in Scotland .....ton | 2/1/7½ | 0/0/0 |
| Bar, Welsh, in London..... | 5/17/6 | 6/0/0 |
| Do. do. at works in Wales ..... | 5/7/6 | 5/10/0 |
| Do. Staffordshire, in London .... | 6/5/0 | 6/15 0 |
| COPPER—British, cake and ingot | 47/0/0 | 47/10/0 |
| Best selected .. | 48/0/0 | 48/10/0 |
| Sheets, strong.. | 55/0/0 | 56/0/0 |
| Chili, bars .... | 44/3/9 | 44/11/3 |
| YELLOW METAL lb. | 0/0/4½ | 0/0/5½ |
| LEAD—Pig, Spanish....ton | 10/1/3 | 10/2/6 |
| English, com. brands ..... | 10/5/0 | 10/7/6 |
| Sheet, English, 3 lbs. per sq. ft. and upwards .. | 12/5/0 | 0 0 0 |
| Pipe ..... | 12/15/0 | 0/0 0 |
| ZINC—English sheet .....ton | 25/0/0 | 0/0 0 |
| Vieille Montagne..... | 25/10/0 | 0 0,0 |
| TIN—Straits .... | 92/5/0 | 92/15 0 |
| Australian .... | 92 15/0 | 93 5 0 |
| English Ingots. | 95/10 0 | 96 0 0 |
| Banca ..... | 95/0/0 | 0/0/0 |
| Billiton ..... | 93/0/0 | 0/0/0 |
| OILS. | | |
| Linseed .....ton | 17/15/0 | 18 0/0 |
| Cocoanut, Cochin | 24/10,0 | 0 0 0 |
| Do. Ceylon ..... | 21/10/0 | 21/15 0 |
| Palm, Lagos .... | 23/10/0 | 24 0 0 |
| Rapeseed, English pale ..... | 24/0/0 | 24/10/0 |
| Do. brown ..... | 22/5/0 | 22/10,0 |
| Cottonseed ref... | 18/0/0 | 18 5/0 |
| Oleine ..... | 20/10/0 | 21/0/0 |
| Lubricating, U.S. | 4/0/0 | 5/0 0 |
| Do. refined ..... | 5/10/0 | 12/0,0 |
| TAR—Stockholm barrel | 0/19/0 | 0/0/0 |
| Archangel .... | 0/12/6 | 0/0/0 |

## TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 12 *noon on Thursdays.*]

ALTON (Hants).—Accepted for the erection of shops, &c. Mr. John Barlow, surveyor:—

E. Buckingham & Son, Winchester ..... £1,340 0 0

BANBURY.—For the surface-water drainage, forming, curbing, flagging, channelling, and macadamising Bath-road, Banbury, for the Corporation, according to plans, sections, specification, and quantities prepared by Mr. S. E. Burgess, Borough Surveyor:—

| | | | |
|---|---|---|---|
| Claridge & Bloxham. | £1,447 2 11 | J. Grant.. ..... | £1,370 12 3 |
| S. Orchard & Son.... | 1,395 0 0 | J. S. Kimberley*.... | 1,305 3 |

* Accepted.

[All of Banbury.] [Surveyor's estimate £1,487.]

BATH.—Accepted for roller flour mill plant, at Box Mill, near Bath, for Mr. R. Walmesley, Lucknam, Chippenham. Mr. Frederick Colyer, engineer:—

J. J. Armfield & Co., Ringwood, Hants ..... £1,264 0 0

BROMLEY (Kent).—For additions of billiard-room, conservatory kitchen, &c, to Nettlestead, Sundridge-avenue, Bromley. Mr Ernest H. Abbott, architect, 6, Warwick-court, High Holborn, W.C Quantities by Mr. A. Johnson, 50, Imperial-buildings, Ludgate Circus, E.C.:—

| | | | |
|---|---|---|---|
| Arnaud & Sons ..... | £1,692 | Bowyer ..... | £997 |
| Hall, Beddall, & Co. ..... | 1,070 | Crossley..... | 995 |
| Gray ..... | 1,040 | Lowe ..... | 958 |

BUSHEY.—For sewerage works for the Watford Union Rural Sanitary Authority. Mr. Urban A. Smith, engineer, Victoria-mansions, Westminster:—

| | | | |
|---|---|---|---|
| A. Kellett..... | £21,599 0 0 | W. Judge ..... | £15,637 18 4 |
| Peattie & Axtell.... | 18,504 5 0 | F. Dupont ..... | 15,355 1 1 |
| E. & S. Bentley .... | 16,808 0 0 | Rackham & Co..... | 15,300 0 0 |
| J. Dickson ..... | 16,805 0 0 | J. Jackson, Plaistow (accepted).. | 14,987 8 7 |
| T. Cooke & Co. .... | 16,765 0 0 | H. Drury..... | 14,954 10 0 |
| J. Neave ..... .. | 16,988 0 0 | Morgan, Isted, & Co. | 14,625 0 0 |
| G. Taylor..... | 15,740 4 7 | | |

DONCASTER.—For the erection of shops, offices, and assembly-rooms, for the Doncaster Mutual Co-operative and Industrial Society, Limited. Mr. Herbert Athron, architect, Dolphin chambers, Doncaster. Quantities by Mr. H. Beck, East Hartlepool:—

| | | | |
|---|---|---|---|
| W. Anelay ..... | £8,785 0 | W. Johnson ..... | £7,770 |
| C. Sprakes & Son ..... | 8,752 10 | H. Arnold & Son*..... | 7,470 |
| J. C. Wombwell ..... | 7,971 0 | | |

* Accepted.

[All of Doncaster.]

FENTON (Stoke-on-Trent).—For the formation of new streets at Fenton, Stoke-on-Trent, for Mr. C. W. J. Smith. Mr. Elijah Jones, surveyor, 10, Albion-street, Hanley. Quantities by surveyor:—

| | |
|---|---|
| Fred. Barker ..... | £480 14 6 |
| John Horobin, Cobridge (accepted) ..... | 464 10 0 |

LINCOLN.—For the erection of new shops, High-street, Lincoln, for the Lincoln Co-operative Society. Mr. J. H. Cooper, architect, Lincoln. Quantities supplied by the architect:—

| | | | |
|---|---|---|---|
| S. & R. Horton..... | £5,051 0 0 | G. Cowen ..... | £4,467 4 0 |
| H. S. & W. Close .... | 4,780 12 0 | J. W. Harrison .... | 4,183 0 0 |
| Wright & Sons, Lincoln* ..... | 4,620 0 0 | | |

* Accepted

LISKEARD.—Accepted for the erection of two pairs of labourers cottages, and offices, for the Duchy of Cornwall. Mr. S. Hooper, architect, Hatherleigh:—

William Wiffen, Holsworthy ..... £895 10 0

LONDON.—For the erection of a Police Section House, Bethnal Green, for the Receiver for the Metropolitan Police District. Mr. John Butler, F.R.I.B.A., Architect. Quantities by Mr. W. H. Thurgood:—

| | | | |
|---|---|---|---|
| Higgs & Hill ..... | £7,140 | Grover & Son ..... | £6,543 |
| Shillitoe ..... | 7,100 | Lathey Bros..... | 6,459 |
| Graham ..... | 6,850 | C. Ansell ..... | 6,330 |
| Hart Bros..... | 6,630 | Killby & Gayford ..... | 6,243 |
| Holloway ..... ..... | 6,600 | Lawrance ..... | 6,205 |
| Scrivener ..... | 6,595 | Brass ..... ..... | 6,173 |
| Smith & Son..... | 6,573 | Willmott ..... | 5,995 |
| Patman & Fotheringham.. | 6,560 | | |

LONDON.—For repairs and reinstatements to the Oakley-place Wesleyan Chapel, Old Kent-road, S.E., for the Trustees. Messrs. Newman & Newman, architects and surveyors, 31, Tooley-street, London Bridge:—

| | | | |
|---|---|---|---|
| Balaam Bros. ..... | £1,421 | Battley, Sons, & Holness .. | £993 |
| J. Bullers ..... | 1,275 | Friggins Bros..... | 971 |
| G. Parker ..... | 1,090 | W. & H. Castle* ..... | 947 |
| J. Falkner..... | 1,057 | | |

* Accepted.

LONDON.—For alterations and additions to No. 141, Canterbury-terrace-mews, Maida Vale, W., for Mr. Henry C. Ash. Mr. Walter J. Ebbetts, architect, Savoy House, 115, Strand, W.C.:—

| | | | |
|---|---|---|---|
| H. Baylis ..... | £357 | R. A. Yerbury..... | £247 |
| Manktelow & Co..... | 250 | | |

Amended tender, including extra works:—

R. A. Yerbury (accepted) ..... £378 17 0

LONDON.—Accepted for new roof and lantern-light to warehouse at rear of 148, Brixton-hill, for Mr. T. Lighton. Mr. M. V. Treleaven, architect and surveyor, Acre-lane, Brixton, S.W.:—

J. Freight ..... £104 0 0

LONDON.—For the erection of a detached villa-residence, Burton-road, Brixton, for Mr. Harry Grover. Mr. M. V. Treleaven, architect and surveyor, Acre-lane, Brixton, S.W. :—

| | | | |
|---|---|---|---|
| Courtney & Fairbairn | £1,150 | Smart & Son | £900 |
| Maxwell Bros., Limited | 1,099 | Cowper | 785 |
| Rice & Son | 1,075 | | |

MARGATE.—For the erection of new church at Westbrook. Mr. T. Andrews, architect, 18, Cecil-square, Margate :—

| | | | |
|---|---|---|---|
| Dove Bros. | £4,225 | Brown & Son | £3,640 |
| W. W. Martin | 3,998 | Robeson & Rickett, Westgate-on-Sea | 3,547 |
| Parsmor & Son | 3,990 | | |
| T. & W. Denne | 3,653 | | |

* Accepted.

NORTH HYKEHAM (near Lincoln).—For additions and alterations to buildings, for Messrs. A. W. Hale & Sons, Lincoln. Mr. J. H. Cooper, architect, Lincoln. Quantities supplied by the architect :—

| | | | |
|---|---|---|---|
| G. Spittel | £424 | J. W. Harrison, Lincoln * | £377 |
| S. & R. Horton | 410 | | |

* Accepted.

ORPINGTON (Kent).—For additions and repairs to shop, also new stables and out-buildings, at Orpington, Kent, for Mr Edmed. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C. :—

| | | | |
|---|---|---|---|
| Somerford & Son | £650 | T. Knight | £619 |
| W. Owen | 642 | Stebbings & Pannett, Sidcup* | 525 |

* Accepted.

OSWESTRY.—For alterations and additions to the Church of Holy Trinity, Oswestry, Shropshire. Mr. E. C. Frere, architect, 3, Furnival's-inn, London, E.C. :—

| | | | |
|---|---|---|---|
| Woodward & Co. | £9,134 | Jno. Gethin | £7,550 |
| Stephens, Bastow, & Co. | 8,796 | Mathews | 7,419 |
| Samuel | 8,088 | W. H. Thomas | 7,100 |

PONDER'S END (Middlesex).—For the erection of mission-room. Messrs. J. E. K. and J. P. Cutts, architects :—

| | | | |
|---|---|---|---|
| E. W. Newman | £802 10 0 | Almond & Son | £699 10 0 |
| J. Tyerman | 762 0 0 | A. Porter | 697 0 0 |
| J. Bentley | 736 0 0 | | |

PRESTON.—For the construction of an iron roof to the boiler-house, central electric light station. Mr. R. Adolphus Came, architect, 27, Mecklenburgh-square, W.C. :—

| | | | |
|---|---|---|---|
| Dixon | £560 0 | Morton | £411 |
| Main & Co. | 450 0 | Lysaght | 409 |
| Foster | 419 19 | McLaren | 398 |

URMSTON (Lancashire).—For the erection of a Registrar's house, two chapels, and entrance-gates, for the Urmston Burial Board. Messrs. Whittenbury & Mather, architects, 74, King-street, Manchester :—

| | | | |
|---|---|---|---|
| John Taylor | £4,222 | J. Kendal | £4,159 |
| William Shaw | 4,221 | A. Bullivant & Sons | 4,032 |
| Young, Tinker, & Young | 4,190 | Chapman & Hollinworth, Patricroft (accepted) | 3,887 |
| Joseph Spark | 4,185 | | |

WINCHESTER.—For the erection of an Higher School, Winchester. Messrs. Pink, Farrow, & Nisbett, architects, Winchester :—

| | New Work. | Old Work. | Total. |
|---|---|---|---|
| Webb | £1,485 0 0 | £143 10 6 | £1,628 10 6 |
| Hutchings | 1,429 0 0 | 129 0 0 | 1,558 0 0 |
| Hammerton & White | 1,370 0 0 | 120 16 0 | 1,490 16 0 |
| Goddard & Son | 1,345 0 0 | 127 0 0 | 1,472 0 0 |
| H. S. Saunders | 1,331 0 6 | 140 0 0 | 1,471 0 0 |
| Fielder & Son, Winchester* | 1,299 0 0 | 132 0 0 | 1,431 0 0 |
| Crook & Son | 1,239 10 0 | 124 17 0 | 1,364 7 0 |
| E. Buckingham & Son | 1,140 0 0 | 115 0 0 | 1,255 0 0 |

* Accepted.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post*.

## The Builder Cathedral Series.

1891.

| | | | |
|---|---|---|---|
| 1. CANTERBURY | Jan. 3. | 7. SALISBURY | July 4. |
| 2. LICHFIELD | Feb. 7. | 8. BRISTOL | Aug. 1. |
| 3. ST. ALBAN'S | Mar. 7. | 9. NORWICH | Sept. 5. |
| 4. PETERBOROUGH | April 4. | 10. ROCHESTER | Oct. 3. |
| 5. WELLS | May 2. | 11. LINCOLN | Nov. 7. |
| 6. EXETER | June 6. | 12. GLOUCESTER | Dec. 5. |

1892.

| | | | |
|---|---|---|---|
| 13. ST. PAUL'S | Jan. 2. | | |
| 14. HEREFORD | Feb. 6. | 20. WORCESTER | Aug. 6. |
| 15. CHICHESTER | Mar. 5. | 21. BANGOR / 22. ST. ASAPH | Sept. 3. |
| 16. ELY | April 2. | 23. WINCHESTER | Oct. 1. |
| 17. LLANDAFF | May 7. | 24. TRURO | Nov. 5. |
| 18. OXFORD | June 4. | 25. ST. DAVID'S | Dec. 3. |
| 19. SOUTHWELL | July 2. | | |

1893.

| | | | |
|---|---|---|---|
| 26. YORK | Jan. 7. | 29. MANCHESTER | April 1. |
| 27. RIPON | Feb. 4. | 30. CARLISLE | May 6. |
| 28. CHESTER | Mar. 4. | 31. DURHAM | June 3. |

Post-free FOURPENCE HALFPENNY each, except Nos. 1, 2, 3, and 4, which are *out of print*; but the VIEW, PLAN, AND DESCRIPTION of CANTERBURY, LICHFIELD, ST. ALBAN'S, and PETERBOROUGH, have been re-printed, and they can now be had, price EIGHTPENCE each set; by post, 10d.

THE REREDOS, ST. PAUL'S.

Reprinted from "THE BUILDER," January 28, 1888 (15 in. by 11½ in.), on stout paper, unfolded, for framing, 6d.; by post, 8d.

PORTFOLIOS,

for Preserving the Plates unfolded, 2s. 6d.; by post, 3s.

*London: Office of* "THE BUILDER," *46, Catherine-street, W.C.*

## TO CORRESPONDENTS.

S. M.—S. Bros.—G. H.—M. P.—C. C. & Co. (too late).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

*We cannot undertake to return rejected communications.*

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matter should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

## PUBLISHER'S NOTICES.

*Registered Telegraphic Address,* 'THE BUILDER,' LONDON.

### CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for Series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY mornings

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C. free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

Now ready.

READING CASES, NINEPENCE EACH. By Post (carefully packed), 1s.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c., 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C.


THE BATH STONE FIRMS, LTD.
BATH,
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening and Preserving Calcareous Stones and Marbles.

DOULTING FREESTONE.

THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.

THE BRAMBLEDITCH STONE. Is of the same crystalline nature as the Chelynch Stone, but finer in texture, and more suitable for fine moulded work.

Prices, and every information given, on application to CHARLES TRASK & SONS, Doulting, Shepton Mallet.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.

HAM HILL STONE.

The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent: Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

CRAIGLEITH STONE.

UNEQUALLED for Staircases, Steps, and Landings, especially for Public Buildings with great wear. VERY HARD, and NEVER WEARS SLIPPERY.

SOLE AGENTS for England,

J. & A. CREW, Cumberland Market, London, N.W.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.
METCHIM & SON, 20, Parliament-st., S.W.
"QUANTITY SURVEYORS' TABLES AND DIARY." Revised and Enlarged for 1892, price 6d., post 7d. [ADVT.

SPRAGUE & CO.,
LITHOGRAPHERS,
Employ a large and efficient Staff especially for Bills of Quantities, &c.
4 & 5, East Harding St. Fetter-lane, E.C. [ADVT.

ESTABLISHED OVER 30 YEARS.
*The Cheapest Prices. Prompt and best Workmanship.*
Ornamental Zinc Work — a Speciality.
For Estimates of every kind of
ORNAMENTAL OR PLAIN
ZINC, COPPER, & IRON ROOFING,
&c., apply to L. LICHTWITZ & CO,
Metropolitan Zinc Works, Westbourne Park, London, W. We solicit your esteemed enquiries.

HOWARD & SONS
*Manufacturers & Contractors.*
Parquet Floor Coverings,
— FROM —
3d. PER FOOT,
IN OAK.
25, 26, 27, BERNERS STREET, W.
FACTORIES: CLEVELAND WORKS, W.

THE PORTLAND STONE
QUARRYING AND WORKING COMPANY.
*Stone of the Best Quality may be obtained in Blocks,*
— OR ESTIMATES FOR —
EVERY DESCRIPTION of WORKED PORTLAND STONE DELIVERED or FIXED
UPON APPLICATION AT THE
COMPANY'S OFFICES. 54, OLD BROAD STREET, LONDON, E.C.

NINE ELMS BRAND.

# PORTLAND CEMENT

ROMAN, MEDINA, PARIAN, KEENE'S PLASTER, and WHITING

*Manufactured by*

# FRANCIS & COMPANY, LIMITED,

The Old Nine Elms Brand, Established 1810. Prize Medals—London, 1851; Philadelphia, 1876 Paris, 1878; Calcutta, 1883; London, 1884. Gold Medal, Paris Exhibition, 1889. Offices and Warehouses: Bridge Foot, Vauxhall, London.—Works: Cliffe-on-Thames.

21 MEDALS AWARDED for EXCELLENCE of QUALITY, BEAUTY of DESIGN.

ESTABLISHED 1850.

# MAW & CO. LIMITED.

Benthall Works, JACKFIELD, SALOP

MANUFACTURERS OF

## PLAIN AND ORNAMENTAL TILES

— FOR —

ENTRANCE HALLS | FIREPLACES | DAIRIES
CHURCHES | BATH ROOMS | DADOS
CORRIDORS | LAVATORIES | VESTIBULES

— AND —

IMPERISHABLE TESSELATED MOSAIC PAVEMENTS.

MAW & CO. will forward, on application, Pattern Books or Special Designs, with Estimates, for all kinds of Floor and Wall Tiling. Patterns can also be seen and particulars obtained at the Show-Rooms of their appointed London Agents Messrs. W. B. SIMPSON & SONS. 100, St. Martin's-lane W.C.

# ALFRED GOSLETT & CO. 26, SOHO SQUARE, LONDON, W.

*Manufacturing, Sanitary, and Ventilating Engineers.*

LEAD, OIL, COLOUR, AND VARNISH FACTORS.

WASHDOWN CLOSET,

In one piece of Earthenware.
POLISHED SEAT, BRACKETS, CAST-IRON WASTE PREVENTER, PULL and CHAIN.
Lead Down Pipe not included.
As shown, 27s. complete.

PLATE, SHEET, and GENERAL WINDOW-GLASS MERCHANTS.

ORNAMENTAL AND STAINED GLASS WORKS.

*Every description of Glass required for Building, Cabinet Making, and Decorative purposes.*

# S. HASKINS & BROS. 22 & 24, OLD ST. E.C.

ESTIMATES AND CATALOGUES FREE ON APPLICATION.

Manufacturers of Revolving Shutters in Wood, Iron, and Steel, Brass Shop Fronts, Spring Shop Blinds, &c.

# HIGH-CLASS JOINERY.

SHOP FITTINGS, CABINET WORK, AND FITTINGS OF EVERY DESCRIPTION.

# D'OYLY'S JOINERY WORKS,

**Limited.**

*Offices:* **405, OXFORD STREET, London, W.**

ESTIMATES GIVEN.

—THE—
# LOCAL GOVERNMENT JOURNAL
*Estab. as THE METROPOLITAN in 1872.*
Contains Reports of all Public Boards in London, Tenders for Building, Paving, and Sanitary Work, and Supplies issued by Public Authorities, the fullest report of the London County Council and its Building Act Committee, and all the Local Government News of the Week, Metropolitan and Provincial. Saturday, 2d.
S. EDGECUMBE-ROGERS,
Dorset House, Salisbury-square, Fleet-street, E.C.

WATER SUPPLY to MANSIONS.
A PRACTICAL PAMPHLET,
One Shilling.
MERRYWEATHER & SONS, LTD.
Long Acre, and Greenwich,
LONDON.
CLEANSE YOUR DRAINS WITH MERRYWEATHER'S "EUCALYPTIC DISINFECTANT & MICROBOLIZER."

DEPARTMENT of SCIENCE and ART,
NATIONAL ART TRAINING SCHOOL, SOUTH KENSINGTON.
Visitor—EDWARD J. POYNTER, Esq., R.A.
Principal—JOHN C. L. SPARKES, Esq.
The ANNUAL SESSION will commence on WEDNESDAY, OCTOBER 5th. Art Classes in connexion with the Training School are open to the public on payment of fees. The classes for men and women students meet separately. The studies comprise Ornament and the Figure with a view to their ultimate use in design and composition, and include the study of Plants and Flowers, the Painting of Still Life, and the Drawing and Painting of Ornament and of the Figure.
Candidates for admission, who are not already registered as students of the school, must have passed the Second Grade Examination in Freehand Drawing. Admission Examinations will be held at the School, on Tuesday, September 27th and October 11th, at 11.45 a.m. and 6.45 p.m. on both days, and on subsequent Tuesdays at frequent intervals during the Session.
Application for information as to fees and for admission should be made in writing to the Secretary, Department of Science and Art, S.W. or on and after OCTOBER 5th, personally to the Registrar at the School, Exhibition-road, S.W.
By order of the Lords of the Committee of Council on Education.

KING'S COLLEGE, LONDON.
INSTRUCTION FOR SANITARY INSPECTORS AND OTHERS.
EVENING CLASSES.
a. Building Construction.
b. General Duties of Sanitary Inspectors.
c. Physics and Chemistry in relation to Sanitary Science.
This Course will commence on FRIDAY, OCTOBER 7th, at 7.30 p.m.
Syllabuses can be obtained from
J. W. CUNNINGHAM,
Secretary.

KING'S COLLEGE, LONDON.
ARCHITECTURAL and BUILDING CONSTRUCTION CLASSES re-commence as follows :—

| | | |
|---|---|---|
| Day Lectures | (1st and 2nd year). | Commence 10th OCT. 1892. |
| Do. | (3rd year) | Do. 14th OCT. 1892. |
| Evening Class | Lectures | Do. 10th OCT. 1892. |
| Do. | Constructional Drawing | Do. 10th OCT. 1892. |
| Do. | Studio | Do. 10th OCT. 1892. |
| Do. | Quantities | Do. 14th OCT. 1892. |

WOOD CARVING SCHOOL.
Day and Evening Class — Commence 10th OCT. 1892.
Students nominated by the Carpenters' Company pay half fees.
The prizes awarded in the last year will be distributed on OCTOBER the 7th next, at KING'S COLLEGE, by SEYMOUR LUCAS, A.R.A. For prospectuses apply to the SECRETARY, King's College, Strand; Prof. BANISTER FLETCHER, 29 New Bridge-street, E.C.; or to STANTON WILLIAM PRESTON, Esq. Carpenters' Hall, London-wall, E.C.

KING'S COLLEGE, LONDON.
DEPARTMENT OF ENGINEERING AND APPLIED SCIENCE.
Mathematics—Professor Hudson, M.A.
Natural Philosophy (Mechanics, Physics)—Professor Adams, M.A. F.R.S. D.Sc.
Chemistry—Professor Thomson, F.R.S.E. F.C.S.
Mineralogy, Geology—Professor Wiltshire, M.A.
Architecture, Building Construction—Professor Banister Fletcher, F.R.I.B.A.
Metallurgy—Professor Huntingdon, F.C.S.
Mechanical Engineering—Professor Capper, M.A. A.M.Inst.C.E.
Drawing—Professor Hulme, F.S.A.
Civil Engineering—Professor Robinson, M.Inst.C.E.
Electrical Engineering—Professor Hopkinson, F.R.S.
The Prospectus may be obtained by application to J. W. CUNNINGHAM, Secretary.

THE BRITISH INSTITUTE of PUBLIC HEALTH.
FOUNDED 1886.
EXAMINATION FOR SANITARY INSPECTORS.
The next EXAMINATION for the CERTIFICATE of COMPETENCY for SANITARY INSPECTORS will commence on WEDNESDAY, the 5th of OCTOBER, 1892.
Forms of application, which should be returned on or before SEPTEMBER 21st, may be obtained from
CHARLES A. JAMES, L.R.C.P.L. D.P.H.
Hon. Secretary.
King's College, London.

THE WORSHIPFUL COMPANY of CARPENTERS, in conjunction with the Council of King's College.
ARCHITECTURE AND BUILDING CONSTRUCTION CLASSES.
The Prizes awarded in the last year will be distributed on OCTOBER 7th next at King's College.
MICHAELMAS TERM :—

| | | |
|---|---|---|
| Day Lectures. | 1st and 2nd year. | Commence OCT. 10th, 1892. |
| Do. | 3rd year | Do. OCT. 14th, 1892. |
| Evening Class Lectures, Constructional Drawing Class, and the Studio | | Do. OCT. 10th, 1892. |
| Quantity Class | | Do. OCT. 14th, 1892. |
| WOOD CARVING SCHOOL. Day and Evening Classes | | Do. OCT. 10th, 1892. |

Students nominated by the Carpenters' Company pay half fees.
For prospectus apply to the Secretary, King's College, Strand; Prof. BANISTER FLETCHER, 29, New Bridge-street, E.C.; or to STANTON WILLIAM PRESTON, Esq. Carpenters' Hall, London Wall, E.C.

SANITARY INSTITUTE EXAM. — Gentlemen rapidly prepared on improved system by correspondence for Sanitary Inspector's Exam. by most successful coach of twenty years' practical experience. No books required. Other subjects include surveying, levelling, roadmaking and sewering. Estates planned, laid out, and managed. Plans, specifications, contracts, &c. Houses examined any part Great Britain. Terms and testimonials.—ASSOCIATE, 29, Galveston-road, Putney.

SANITARY INSTITUTE, LONDON.—GENTLEMEN PREPARED for the SANITARY INSPECTORS', SURVEYORS', and other EXAMS. of the SAN. INST. or any other SANITARY EXAM. by a SANITARY ENGINEER. Certificated Surveyor and Inspector by above, first honours Medallist Hygiene, full first honours Plumbing City Guilds, Lond. Upwards 170 recent successes San. Institute exams. Next exam. in Dec. 1892. Tuition by correspondence. For terms, testimonials &c. apply as below. Engineering drawings of every description, with plans, surveys, quantities, and specifications, rapidly prepared. Advertiser can be consulted on all matters connected with Sanitary Engineering.—Address, MEM. SAN. INST. Box 196, Office of "The Builder."

# BILLS OF QUANTITIES, &c.
CORRECTLY WRITTEN AND LITHOGRAPHED BY RETURN OF POST CERTAIN. PLANS Best Style.
J. L. ALLDAY,
*Shakespere Printing Works, Birmingham.*

SANITARY INSPECTORS.—Examinations for qualifications under the SANITARY INSTITUTE are held periodically. A member of the above Institute, and holder of certificates of competency in sanitary knowledge and building construction, is prepared to coach men for these or similar exams. by correspondence. Fees ENTIRELY CONDITIONAL ON THE PUPIL'S SUCCESS, payable after passing, bar a nominal guarantee of good faith.—J. W. T. Wendreda, Wimbledon.

SURVEYORS' INSTITUTION and SANITARY INSTITUTE EXAMINATIONS.—CANDIDATES COACHED, Personally or by Correspondence. Practical lessons in quantity surveying (London system), estimating, and analysis of builders' prices. Saturday Land Surveying Class.—C. B. W. 37, Ireneroad, Parson's Green, S.W.

SURVEYORS' INSTITUTION EXAMINATIONS.—A complete COURSE of PREPARATION for these EXAMINATIONS by correspondence or in class. The course for 1893 commenced recently. That for 1894 will commence about the end of this month.—For terms apply to Mr. RICHARD PARRY, F.S.I. Assoc.M.Inst.C.E. 21, Parliament-street, S.W.

MR. BUSBRIDGE'S EVENING DRAWING CLASSES, under the Science and Art Department, will RESUME, in various parts of London, the first week in OCTOBER, for the Study of Building Construction, Carpentry and Joinery, Architectural and Geometrical Drawing. Fees for the whole course, 10s.—Full particulars from W. BUSBRIDGE, Grasmere, Plumstead.

CLASSES of SCIENTIFIC MASONRY will open OCTOBER 6th next. Certificates awarded. Pupils recommended as Clerks of Works and Foremen. Several important appointments have been obtained.—For particulars apply to PROF. UNWIN DEAN City and Guilds of London Institute, South Kensington.

EVENING CLASSES in Building Construction, plumbing, brickwork and masonry, carpentry and joinery, machine construction, tools, &c. at the Aldenham Institute, Goldington-crescent, Pancras-road, N.W. Good teachers. Low fees. New session just commencing. Syllabus post free on application to the SECRETARY.

TO QUANTITY SURVEYORS.—Gentleman (50), with varied practical outdoor experience, including measuring-up work, desires to give time instead of premium for insight into practical working of a good quantity surveyor's office. Accurate and systematic.—Address, Box 147, Office of "The Builder."

FOR SALE, Patent Rights for the Manufacture of Water-Closets, Lavatory Basins, and other Earthenware goods by machinery. Would entertain applications for licences.
Address—WRIGHT SUTCLIFFE & SON,
Adelaide-street, Halifax.

ROOMS and OFFICES.—TO BE LET, for trade and professional purposes, in prominent public building near Chancery-lane. Convenient room on ground floor near main entrance, vacated within the last few days and being done up. Rent 35l. Two superior offices, second floor, occupied for many years by firm of solicitors. Newly re-decorated. Rent 45l. the two. A large upper board-room, &c. 22 feet by 15 feet, with bay window. Rent only 36l. And two small offices communicating. Rent 25l.—Apply HOUSEKEEPER, Gray's Inn Chambers, 20, High Holborn.

SURVEYORS, Draughtsman, Builders, and Others.—TO BE LET, light OFFICES in Chancery-lane.—Apply for particulars, MANAGER, 63, Chancery-lane, W.C.

TO ARCHITECTS.—Light OFFICES TO BE LET in Westminster. First floor, three rooms, 42l. Second floor, two rooms, 22l.—Apply, 7, Little Queen-street, Westminster.

OFFICE TO BE LET.—Room on Mezzanine ground floor in architect's office in Queen Anne's Gate, Westminster, TO BE LET, unfurnished, rent 50l. Highest references given and required.—Apply in first instance to Box 159, Office of "The Builder."

SHARE of OFFICE, &c.—Advertiser is desirous of sharing his office and chambers, situate in Bedford-row, W.C. Rent, &c. very moderate. Suitable for young architect or surveyor.—Box 165, Office of "The Builder."

TO ARCHITECTS and OTHERS.—Very eligible self-contained Suite of PROFESSIONAL OFFICES. Three capital rooms, 25 ft. 6 in. by 14 ft.; 17 ft. by 12 ft. 6 in.; 17 ft. by 12 ft. 6 in. First floor. Excellent light. Lincoln's Inn-fields (west side).—Apply to Messrs. LANDER & BEDELLS, Architects, No. 6, John-street, Bedford-row, W.C.

ARCHITECT and QUANTITY SURVEYOR (Hard-working), with a rapidly increasing connexion, desires a PARTNER. A good opportunity for a young gentleman, well connected and capable of introducing business, who is desirous of becoming proficient in quantities.—Address in confidence, Box 157, Office of "The Builder."

PARTNER (Working), DECORATOR and BUILDER. Established half-a-century. Situated in the Midlands, with best position in the town, 45,000 inhabitants, and having opportunities of doing greatly increased business. Proprietor being principally a decorator, is willing to accept practical and energetic joiner as WORKING PARTNER. Satisfactory references required.—Box 150, Office of "The Builder."

A PARTNER can be received in a high-class ARCHITECTURAL PRACTICE. Long established, and likely to be at once considerably increased. Premium required.—Address, Box 164, Office of "The Builder."

TO ARCHITECTS Providing Quantities.—ASSISTANCE OFFERED as required by Advertiser, in taking off and working up quantities, measuring up variations, adjusting accounts, &c. London experience, and references to Architects. Terms very moderate.—A. STONE, 270, Fulham-road, S.W.

CIVIL SERVICE COMMISSION.
FORTHCOMING EXAMINATION. Second-class ASSISTANT SURVEYOR in the Office of Works, &c. (23-30) 13th OCTOBER. Technical training and qualifications necessary.
The date specified is the latest at which applications can be received. They must be made on forms to be obtained with particulars from the SECRETARY, Civil Service Commission, London, S.W.

DRAUGHTSMAN WANTED, in Horticultural Builder and Heating Engineer's Office in Birmingham. Preference given to a man with previous experience in the business, and having a knowledge of shorthand.—Address, stating age, salary required, and all particulars, to Box 279, Office of "The Builder."

VESTRY of ST. PANCRAS.
APPOINTMENT of SANITARY INSPECTOR.
The Health Committee of the St. Pancras Vestry REQUIRE a SANITARY INSPECTOR, aged from 25 to 40 years.
The person appointed will be required to devote his whole time to the duties of his office, and to reside in the Parish, and to sign an agreement not to claim superannuation.
The salary will be 120l. per annum.
No candidate will be eligible who does not possess the Certificate of the Sanitary Institute, or other examining body, and the appointment will be subject to the approval of the Local Government Board, and in accordance with the terms of the Sanitary Officers' (London) Act, 1891, and of the bye-laws of the Vestry relating to the Health Department.
Applications for the foregoing appointment must be in the candidate's own handwriting, and made on forms to be obtained from the undersigned, and be accompanied by copies of not less than three or more than six testimonials of recent date, and sent in to me, the undersigned, not later than TWELVE o'clock noon on SATURDAY, the 24th SEPTEMBER, 1892.
Candidates will be required to attend the Health Committee on WEDNESDAY, the 28th SEPTEMBER, 1892, at FOUR o'clock in the afternoon.
No travelling or other expenses will be allowed.
Any candidate canvassing any or either of the members of the Vestry personally, by letter or otherwise, will be disqualified.
By order,
WILLIAM MALLISON,
Vestry Hall, Chief Clerk, Health Department.
Pancras-road, N.W.
September 14th, 1892.

BEXHILL LOCAL BOARD.
SURVEYOR AND INSPECTOR OF NUISANCES.
AMENDED ADVERTISEMENT.
The Local Board of Bexhill are prepared to receive APPLICATIONS for the APPOINTMENT of SURVEYOR and INSPECTOR of NUISANCES for their district, the duties to be all such as are defined in the Orders of the Local Government Board.
The applicants must hold a Certificate of the Sanitary Institute, and the person appointed must devote the whole of his time and attention to the duties of the office, and must not undertake any private practice.
The salary will be 175l. per annum, with a yearly increase of 20l. up to 300l. per annum.
Applications for the appointment to be addressed to the Clerk as under, in writing, on or before the 8th day of OCTOBER next, and must state age and qualifications, with references.
Any candidate canvassing any member of the Board, either by letter or personally, will be thereby disqualified.
Dated this 14th day of September, 1892.
FRED. A. LANGHAM,
Clerk to the Bexhill Local Board.
No. 44a, Robertson-street,
Hastings.

A VACANCY occurs in an Architect's Office near London for an ARTICLED PUPIL. Moderate premium.—Address, Box 160, Office of "The Builder."

MASTER BUILDER WANTED for important work.—Address, PROPRIETOR, 5, Circus-terrace, South-street, Greenwich, S.E.

CLERK WANTED.—WANTED, a Quantity and Correspondence CLERK. Must be thoroughly competent in cubing dimensions, and generally quick at figures.—Apply stating salary required and full particulars, to ROWLAND BROS. Timber Merchants and Contractors, Bletchley.

CLERK WANTED by Birmingham Builder. Must be fully competent to measure up works in all trades as executed, prepare bills of extras and omissions to contracts, keep prime cost, and prepare day work accounts. Applicants to give references as to ability, and state salary required.—Box 282, Office of "The Builder."

CLERK WANTED by a West-end Builder and Contractor, accustomed to the general routine of an office. Salary 30s.—Reply, giving full particulars, to Box 285, Office of "The Builder."

BUILDER'S CLERK WANTED, in Office ten miles from London. Well acquainted with office duties. Able to keep prime cost and jobbing accounts. Good opening for young and energetic man.—Address, stating salary desired, to Box No. 287, Office of "The Builder."

JUNIOR CLERK WANTED in West-end builder's office. Quick at squaring dimensions, abstracting, &c.—Apply, stating age and salary, to Box 284, Office of "The Builder."

YARD CLERK in Builder's Yard. Previous experience necessary.—Letters only, G. 135, High-street, Wandsworth.

GENERAL FOREMAN WANTED, to TAKE CHARGE of building jobs in London. Thoroughly steady and competent in all trades, and good manager of men. Permanency to good man.—Address, stating experience, age, salary required, and recent references. JUNIOR CLERK also WANTED, in Builder's OFFICE. Hours 6 to 5.—Address, stating age, salary, capabilities, &c. to Box 281, Office of "The Builder."

GENERAL FOREMAN.—WANTED at once, a thoroughly practical and energetic man, carpenter by trade preferred.—Apply by letter, stating age, wages, and references, to Box 288, Office of "The Builder."

IRONMONGER'S GENERAL JOBBING HAND WANTED. Gas-fitting, plumbing, and other branches. Constant job.—Apply personally, 4, Blackburn-rd. West Hampstead.

GILDERS and FRAME MAKERS.—WANTED, for a good country business, a first-class workman for the above branches.—Apply, stating wages, Box 280, Office of "The Builder."

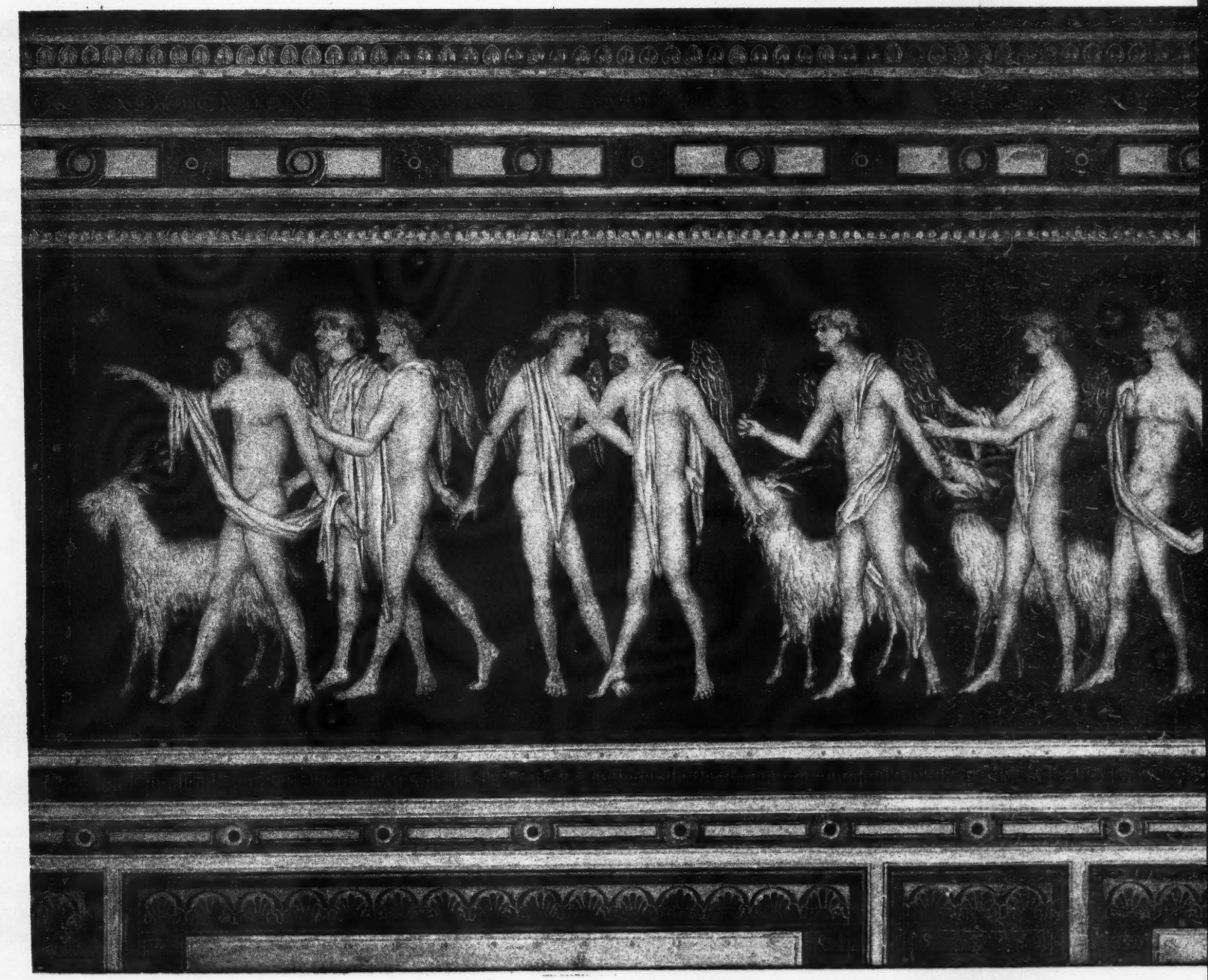
MASON. — WANTED, for Constancy, good Mason for the general work of a builder's. One capable of filling post of working foreman of masons if required. — Reply, stating wages and references, to Box 283, Office of "The Builder."

WANTED, thoroughly competent MAN for the country, to work saw bench, planing and tenoning machines, or to turn to bench (joiner) work if required.—Apply, stating wages, age, and references, to E. NEWTON & CO. Hitchin.

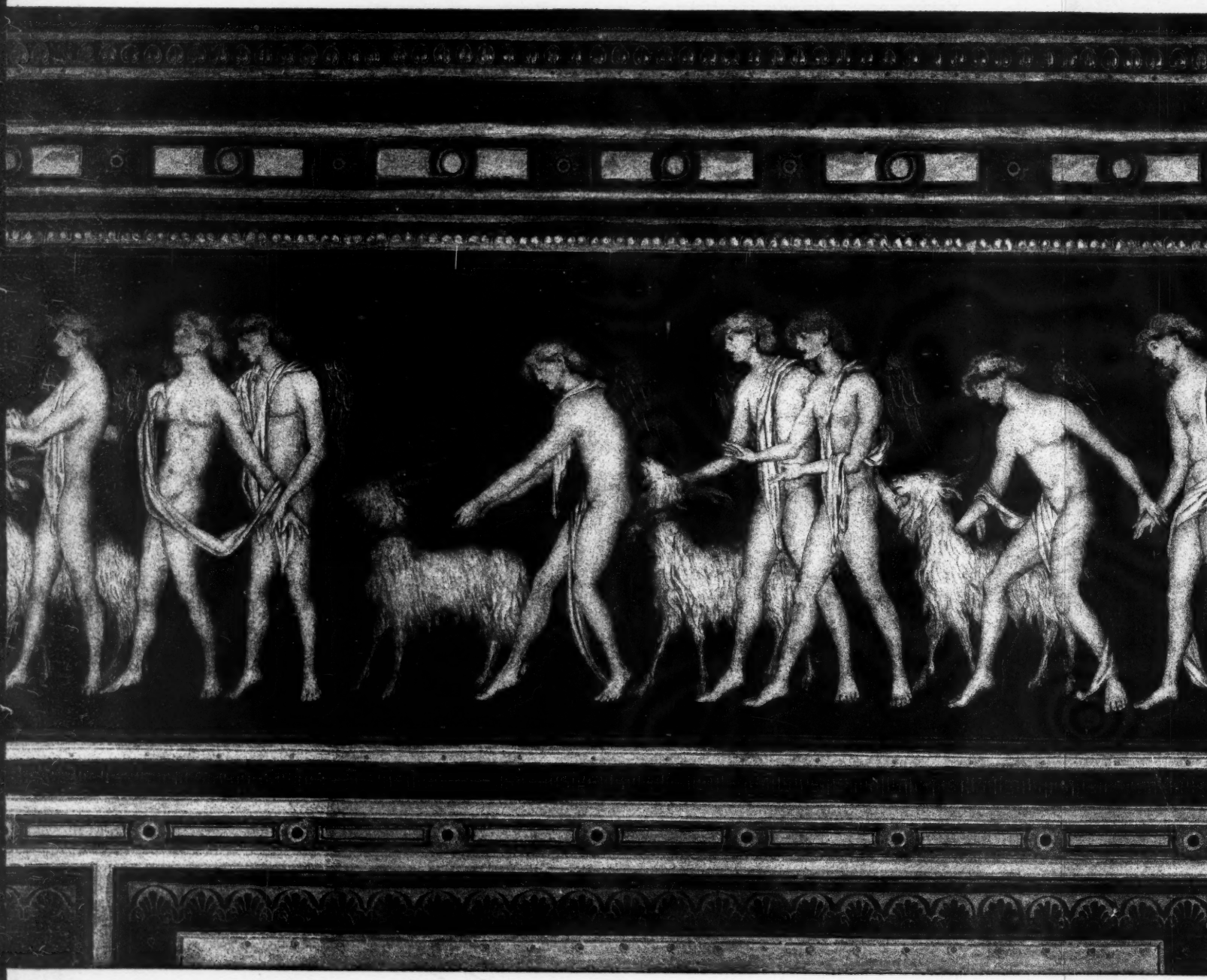
CERTIFIED PLUMBER WANTED, for Rangoon, having thorough knowledge of Shine & Ault system. Three years' agreement. Commencing salary 200 rupees per month.—Apply by letter to VERITAS, 19, St. Bride-street, E.C.

PLASTERING and POINTING to Two Houses To Be Let.—Apply to Mr. KIRBY, Oakhill-road, Crescent-road, Beckenham, Kent.

PLASTERERS.—Little Job in country to LET at once.—Box 286, Office of "The Builder."

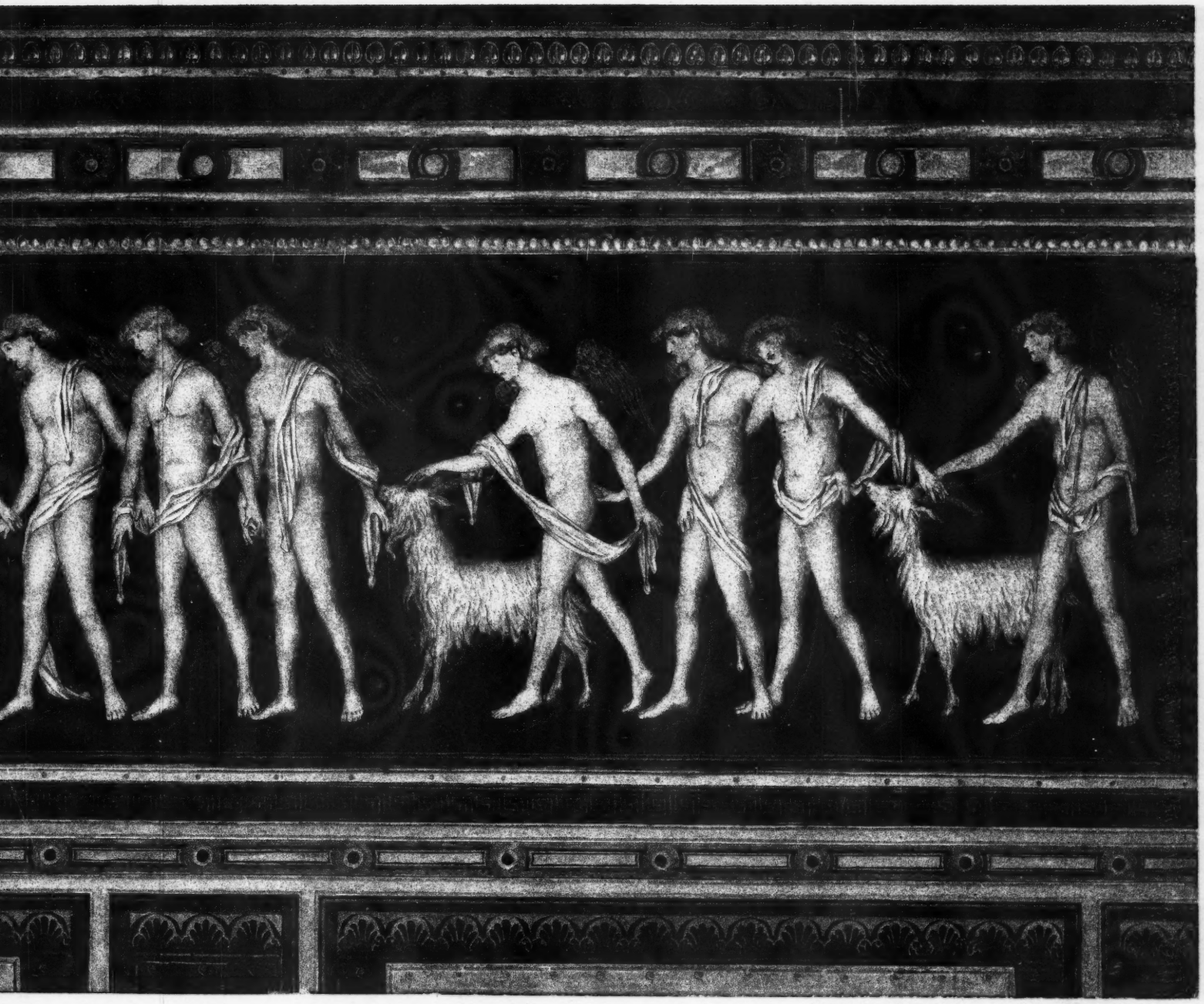


*Royal Academy Exhibition, 1892.*

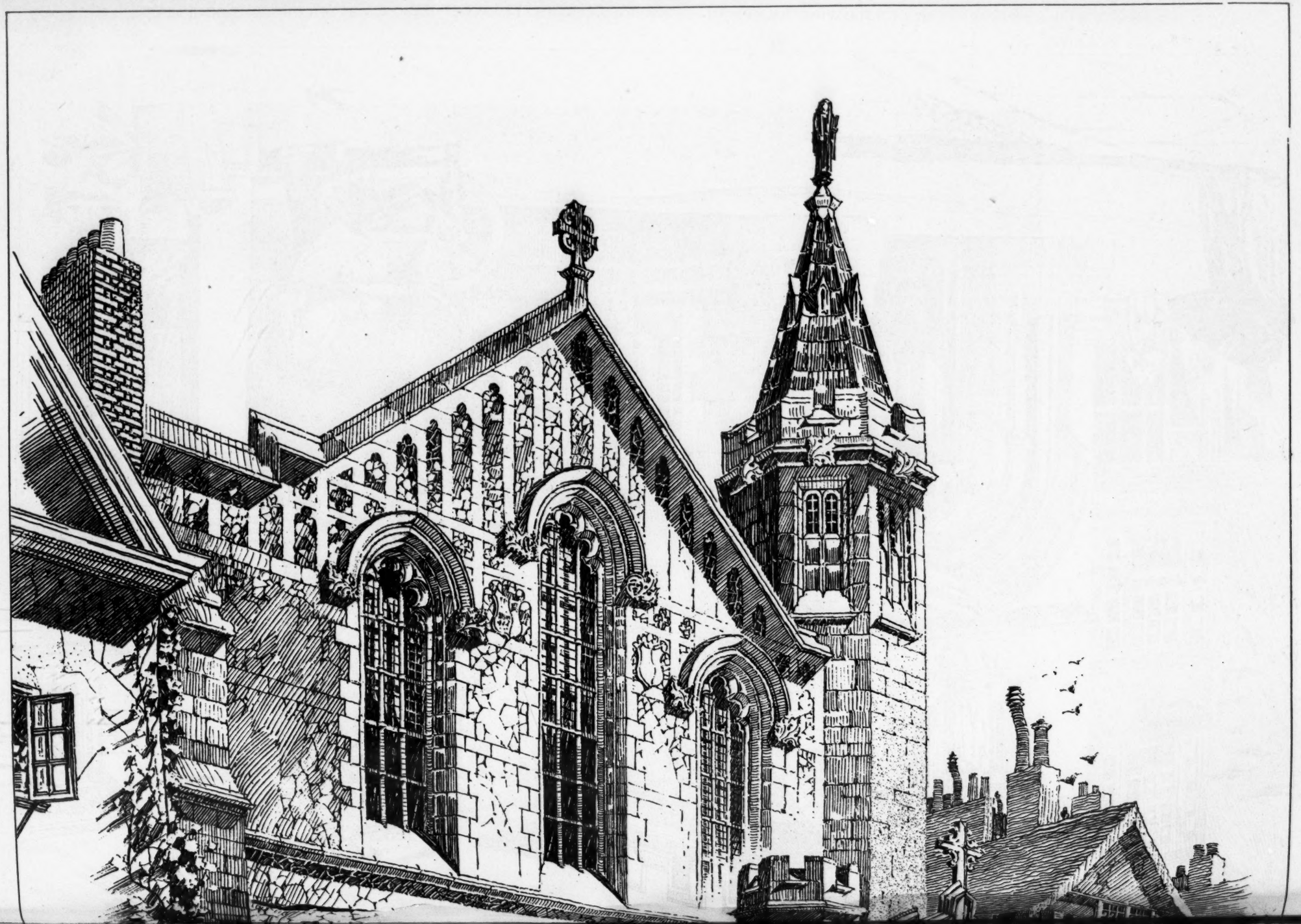


FRIEZE: "AMORES CAPRARII."—DESIGNED BY MR. JOHN S. BABB.

Put this on a good linen Slab.



INK-PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.



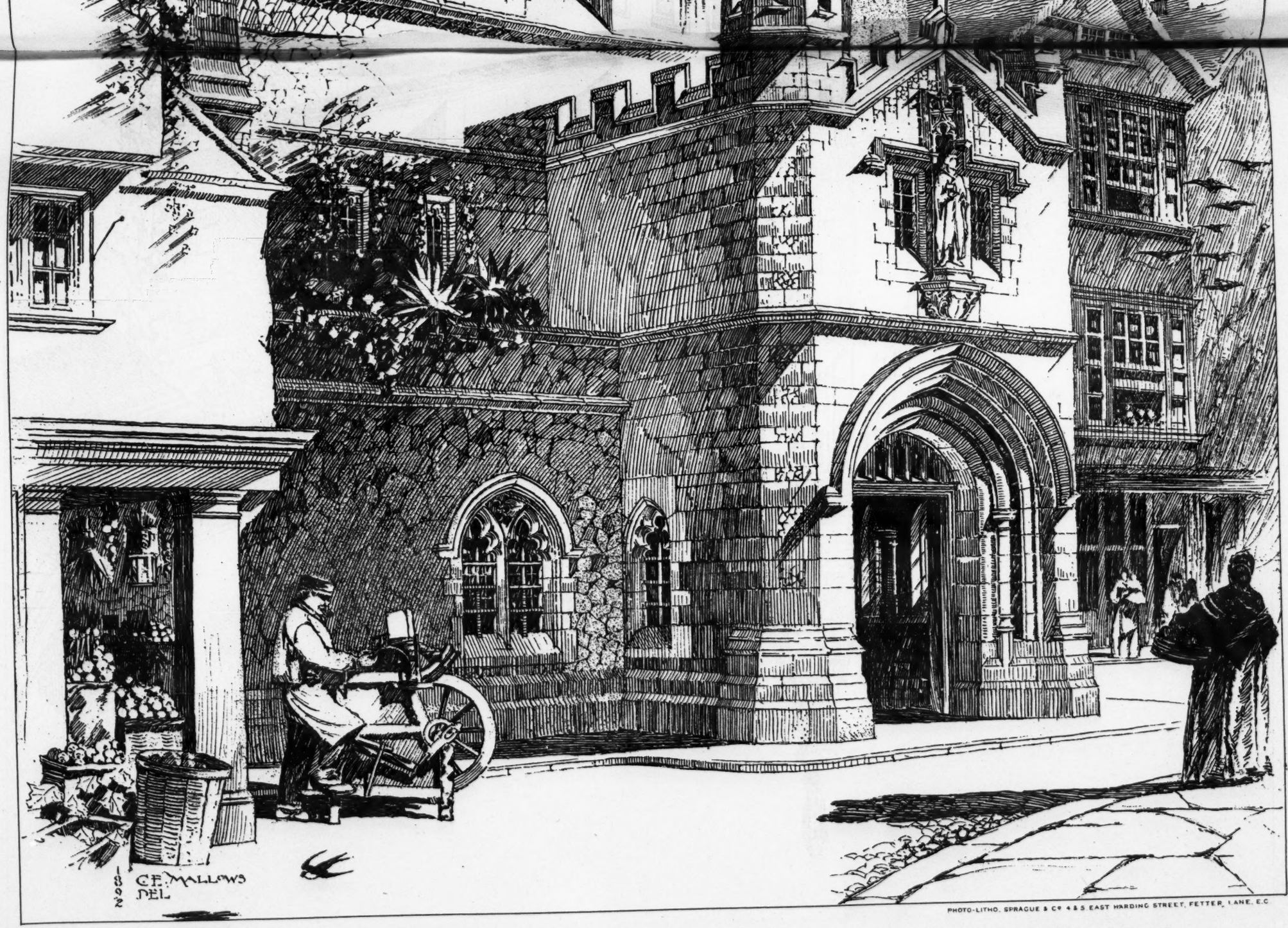



PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

EXTERIOR VIEW OF THE NEW NORTH TRANSEPT: ST. BARTHOLOMEW THE GREAT, SMITHFIELD.—Mr. Aston Webb, F.R.I.B.A., Architect.

*Royal Academy Exhibition, 1892.*

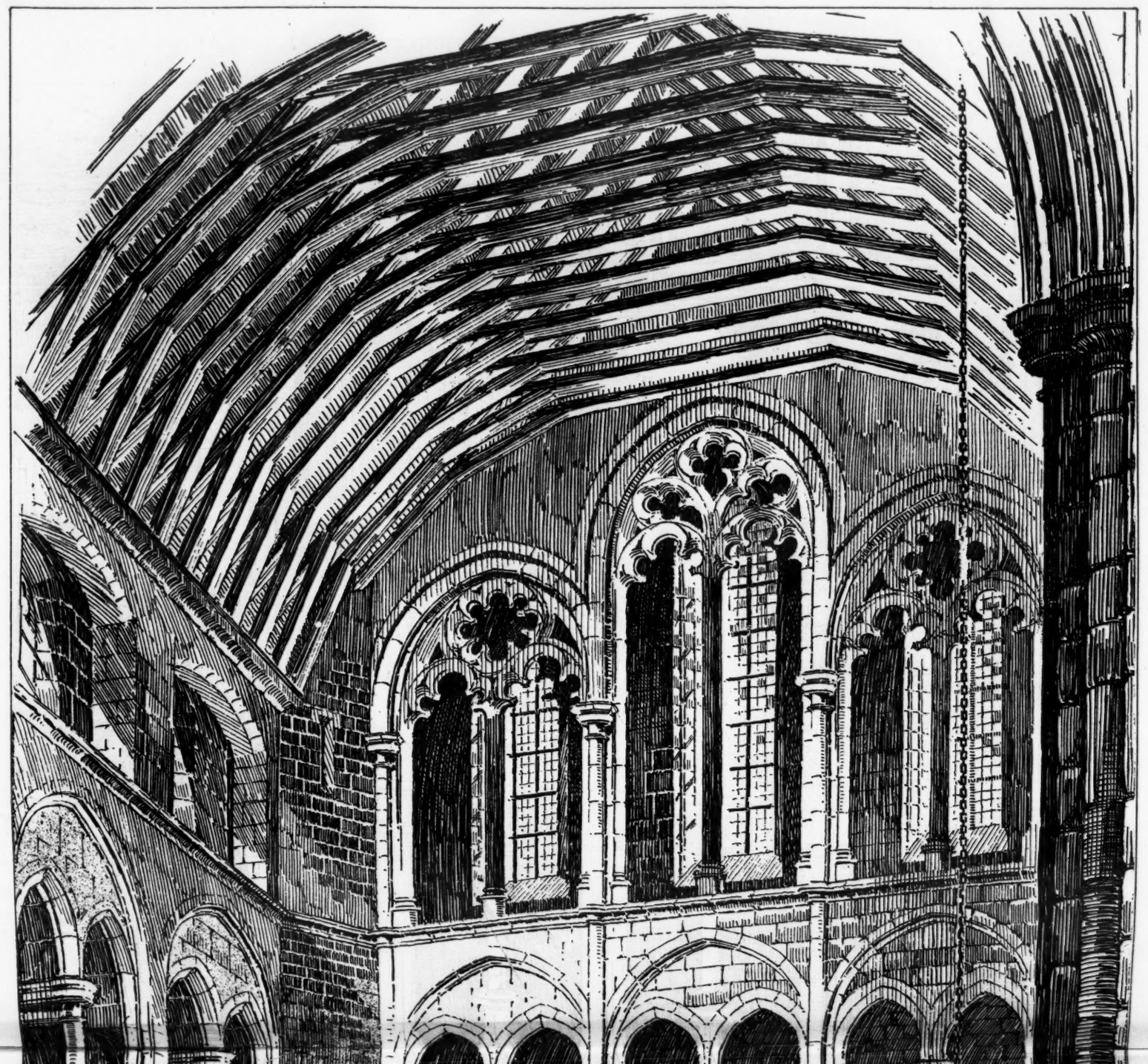
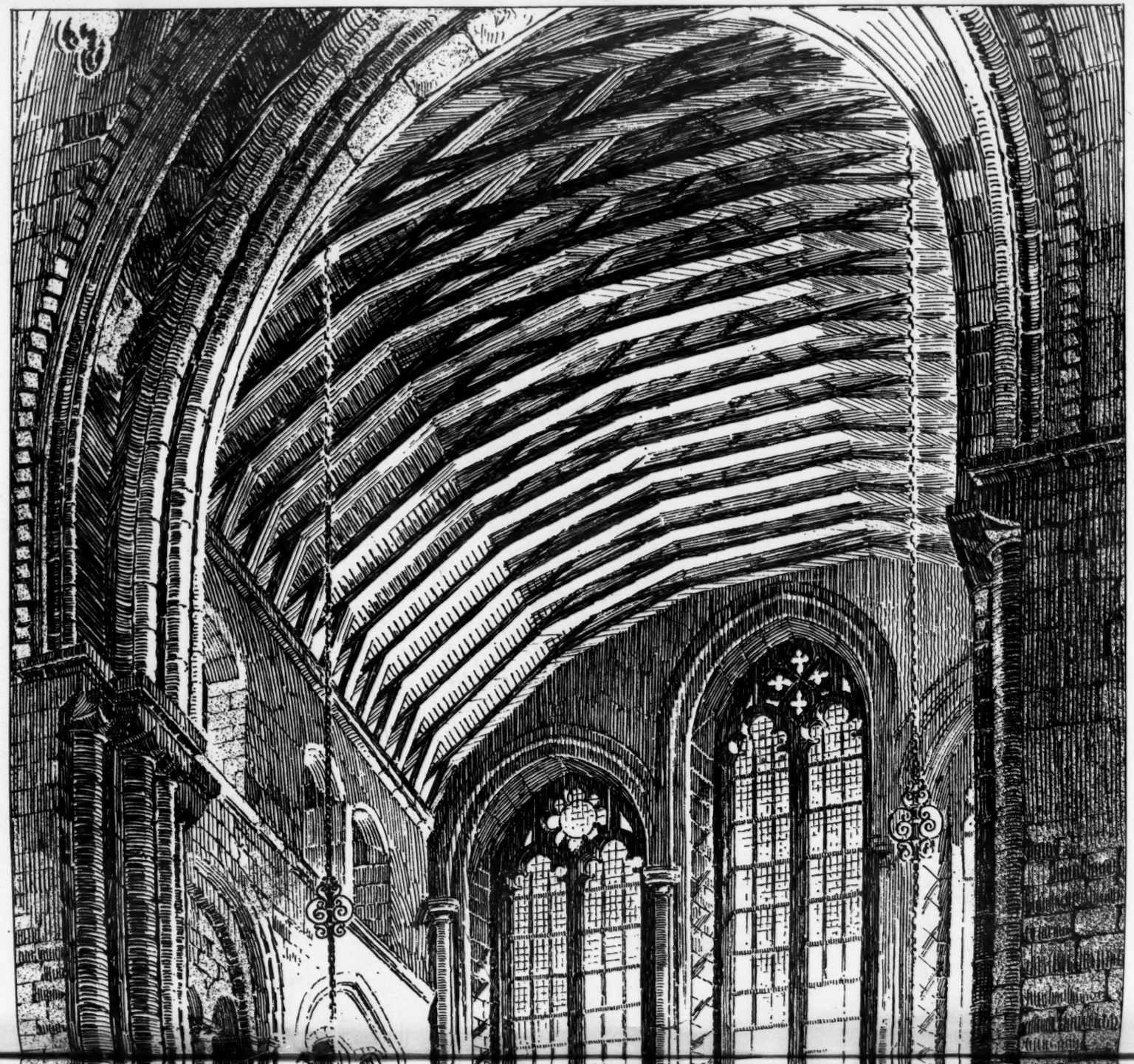


PHOTO-LITHO. SPRAGUE & Cº 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

THE NEW NORTH TRANSEPT: ST. BARTHOLOMEW THE GREAT, SMITHFIELD.—Mr. Aston Webb, F.R.I.B.A., Architect.

*Royal Academy Exhibition, 1892.*



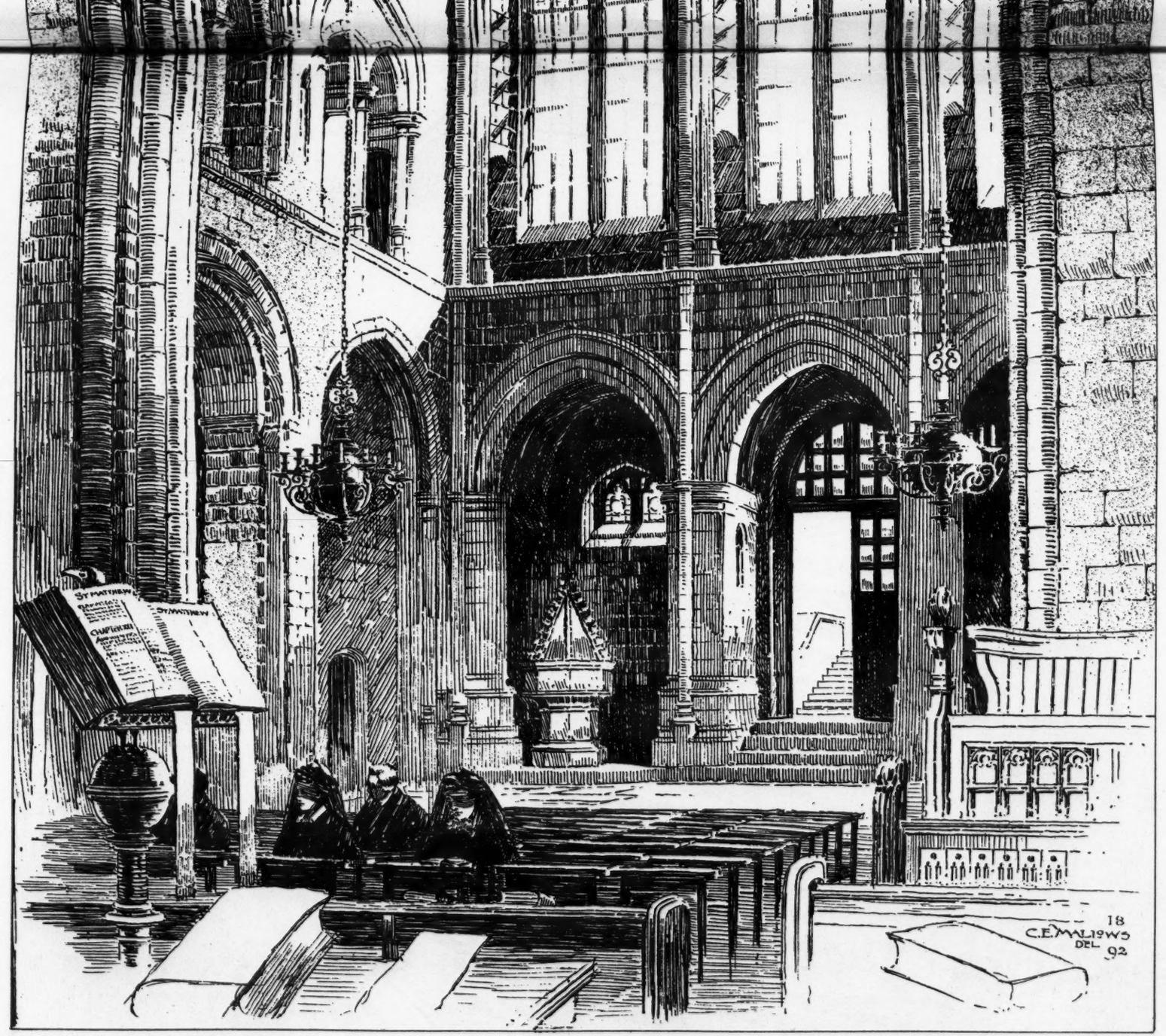



PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE NEW SOUTH TRANSEPT: ST. BARTHOLOMEW THE GREAT, SMITHFIELD.—Mr. Aston Webb, F.R.I.B.A., Architect.

*Royal Academy Exhibition, 1892.*